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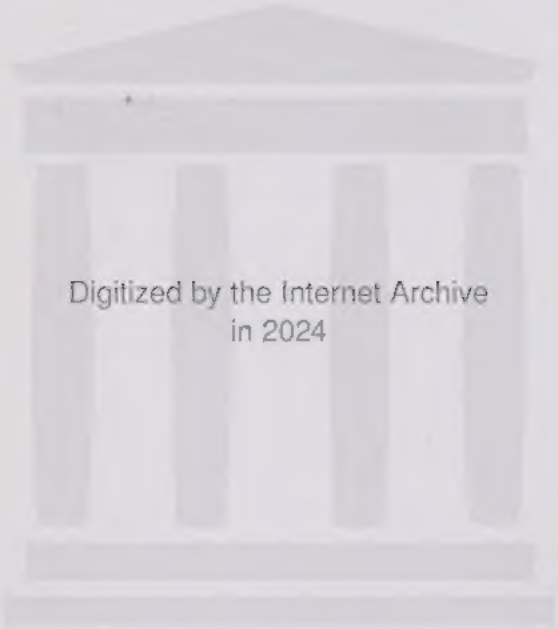
VOLUME 2

ISAAC ASIMOV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THE BOOK OF FACTS VOLUME 2

Did you know that Winston Churchill was born in a ladies cloakroom? That the Tower of London once housed a zoo? That literacy in Iceland is 100 per cent? That honey is used as a centre for golf balls and in antifreeze mixtures? That one legal term for adultery is 'criminal conversation'?

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The Book of Facts
Volume 2

Isaac Asimov

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A FEW OPENING REMARKS

(The author's foreword from the original edition of ISAAC ASIMOV'S BOOK OF FACTS in one volume)

I've always been slightly drunk with facts, and almost all of my more than two hundred books have dealt, at least incidentally, with facts. Now I've compiled and edited this book that deals only with facts – a special collection for those who love facts as much as I do.

Here are three thousand facts of all kinds – facts that are off-beat but true, facts you never knew, facts you can't believe, 'facts' you always believed but that happen to be wrong – facts that will teach you, amaze you, and tickle your funny bone.

Perhaps you, too, are 'turned on' by learning that: Karl Marx thought communism would not catch on in Russia . . . the father of gerontology lived to be nearly 103 years old . . . Jimmy Carter is the first U.S. President to be born in a hospital . . . brothers-in-law of Abraham Lincoln fought for the Confederacy . . . the Nile River has been known to freeze over . . . no scientist and no science fiction writer – myself included – predicted that Mars was cratered.

The Nobel Prize winner Ivan Petrovich Pavlov said, 'Learn, compare, collect the facts.' Well, Ivan, I've been up to my sideburns in them. In all, I examined and sifted just over six thousand (from the tens of thousands evaluated by our researchers) and finally selected three thousand beauties for this first *Book of Facts*.

There's a delectable mix here, a panorama of facts dealing with practically every aspect of the universe, human and non-human, animate and inanimate, on Earth and beyond.

You pleasure can begin absolutely anywhere. You can start on page one and zip right through to the very last page. Or you can start in the categories of particular interest to you, and then roam through the book. Or from the very first you can simply poke around, hither and yon, where and when, picking out new and amazing facts and boggling the mind. I'll be surprised if you don't find surprises on every single page (I did!).

ISAAC ASIMOV

AN INVITATION FROM ISAAC ASIMOV

You know me – once I get my electric typewriter roaring along on something dear to my heart, I don't know when or how to unplug.

Before the ink was dry on these pages, I was already pitching another *Book of Facts*. And our editorial board, contributors, and assistants have continued to sift through and verify thousands of new items. As before, we will be picking the best.

It's a fact that nobody's perfect, not even Isaac Asimov, and I may have let a non-fact or two get by me. I'm counting on you to let me know if you find any.

And I've undoubtedly overlooked good items that you know about. I'd liked to hear about them, too. Send me *your* favourite facts . . . fantastic facts . . . unexpected facts . . . astonishing facts . . . fascinating facts . . . bizarre facts. Let me have facts that enlighten . . . facts that disprove popular belief . . . facts that rouse awe and wonder.

If they're that good, and if they can be verified, you will be paid and they will be included in the next *Book of Facts*.

Send your facts, together with their documented sources (where you got the facts, or how you know them to be true), and a self-addressed, stamped envelope to me in care of

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Enjoy this one, and help me with the next!

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MILITARY

One of the holders of the first number (258) in the U.S. military draft lottery in 1917 was an Alden C. Flagg. His son, Alden C. Flagg, Jr., of Boston, was a holder of the first number (158) in the U.S. peacetime draft lottery of 1940.

A dwarf eighteen inches high served as a captain of cavalry in the British army. He was Jeffery Hudson and lived from 1619 to 1682. He made his first recorded appearance when he was served inside a pie at the table of the Duke of Buckingham. Later, when he was about thirty years old, he grew to more than twice his earlier adult height – to three feet, nine inches.

One of America's great naval heroes was born John Paul, in Scotland, in 1747. After killing a mutinous crew member in self-defense, he fled to the colonies (to avoid trial) and added Jones to his name. He commanded the *Bon Homme Richard* during the Revolutionary War and won a great battle over the British ship *Serapis*. Jones is also known for his proud statement when he was asked to surrender: 'Sir, I have not yet begun to fight.'

Americans twice saved from execution Baron Fabian von Schlabrendorff, one of the German officers who had tried to assassinate Hitler. The conspirators had detonated a bomb in Hitler's headquarters on July 20, 1944, but Hitler received only minor wounds. The evidence implicating von Schlabrendorff was in the hands of the president of the German People's Court when a bomb from a raid by a thousand American planes killed the president. Von Schlabrendorff lived to be released from prison by U.S. troops on May 4, 1945, as a Gestapo guard was readying to execute him.

Before he built his financially successful steamboat Robert Fulton developed a "diving boat" that he thought could be used to sneak up on and place explosive charges against the hulls of enemy vessels. Napoleon encouraged the American inventor, but discontinued his support after Fulton had spent the summer of 1801 unsuccessfully trying to overtake a British ship. Undaunted, Fulton went to the *British* who authorized an attack on the *French* fleet at Boulogne. The torpedoes didn't work. Back in New York, Fulton actually torpedoed a ship in a demonstration, but the U.S. expressed no interest in pursuing the invention.

Babur, the first Mogul emperor of India, marched through the Khyber Pass onto the North Indian plain in 1526. The then North Indian ruler, an Afghan king, Sultan Ibrahim, leading an army of 100,000 men, attacked the invaders and lost, despite the nearly ten-to-one odds in manpower in his favor. The reason for Babur's triumph was an ancient Chinese invention that the Sultan had never heard of — gunpowder.

The only U.S. Navy man hanged for mutiny was the son of a secretary of war. In 1842, midshipman Philip Spencer was found guilty, along with two enlisted men, of plotting to turn their ship, the U.S.S. *Somers*, to piracy.

Spain acquired more new territory in one generation than Rome had conquered in five centuries. She eventually owned all of South America and Central America — from Cape Horn to the Rio Grande — plus much of what is now the United States. By 1580, Spain had the only permanent European settlements in the New World in addition to outposts in the Philippines.)

Joseph Stalin's son Jacob was captured during World War II, but Stalin rejected the German offer of prisoner exchange and Jacob died in a prison camp.

Big Bertha was the nickname given to two different sets of long-range German cannon in World War I, but it was a name mistakenly given. It was thought the artillery was produced in the Krupp works in Germany, hence the name in honor of the Krupp family, Frau Bertha von Bohlen. Actually, they were produced by Skoda, in Austria-Hungary. With barrels just over a hundred feet in length, the Big Bertha's one-ton projectiles were able effectively to pound Liège, Antwerp, and Verdun from a distance of seventy-six miles.

French archivists claim that the first French soldier who was wounded in the Franco-Prussian War was also the last to be killed, six months later, in 1871

Two months passed between the U S. declaration of war on Germany in 1917 and the arrival in Europe of the first skimpy contingents of the American Expeditionary Force Another four months passed before any American fired a shot at a German The Americans and the Germans didn't clash in force until the Battle of Belleau Wood on June 6, 1918 – the same month and day on which the Allies would invade Europe twenty-six years later in World War II.

Douglas MacArthur's mother used to send fawning letters to his army superiors suggesting that it was time for her son to be promoted to general.

In a rowboat in the St Lawrence River, in the twilight of September 12, 1759, British General James Wolfe sat and repeated nearly the whole of Gray's 'Elegy' He would have preferred being the author of that poem, he said, to the glory of beating the French come the dawn The next day, Wolfe died at the moment of victory The best-known line of Gray's poem is 'The paths of glory lead but to the grave'

Francisco Pizarro, the nearly illiterate Spanish adventurer,

conquered the grand empire of the Incas with a force of no more than 106 foot soldiers and sixty-two downtrodden horses – and gunpowder!

When World War I broke out, Lenin was on a walking tour in the Dolomites. Subsequently, he was imprisoned and might have been shot as a Russian spy by the Austrians if the Socialist mayor of Vienna hadn't believed Lenin was a greater danger to the Russians than he was to the Austrians.

Sauerkraut was renamed 'liberty cabbage' by Americans during World War I. In their denunciation of all things German, some Americans actually kicked dachshunds.

During the Crusades, the Arabs produced a 'Molly Pitcher' who took her fallen husband's place in battle. The wife of an archer who was killed at the Battle of Damascus picked up his bow and immediately joined the conflict. She hit the Crusaders' standardbearer with one arrow and the commander with another, damaging morale and contributing to the Arab victory.

Napoleon, if he had conquered Egypt, would have tried to dig a canal at Suez for better access to the wealth of India which the French had lost to the English in 1763.

During World War II the American air force stationed at Gander, Newfoundland, found that Eskimo hunters who had never before seen a machine were top technicians.

The Battle of New Orleans, which made Andrew Jackson a national hero, was fought two weeks after the war of 1812 had ended and more than a month before news of the war's end had reached Louisiana.

During World War II, there was a rumor that the Germans were buying up adrenal glands in Argentine slaughterhouses and that extracts of the glands were enabling Nazi pilots to fly and fight at heights of 40,000 feet. The rumor was untrue, but it spurred American investigation of the adrenals. By 1944, Compound A was synthesized, in 1946, Compound E was.

Cavalry captured a fleet during the wars of the French Revolution. General Charles Pichegru, invading Holland in the winter of 1794, found Dutch ships icebound off the coast. He led his Hussars in a charge across the frozen waters and seized the vessels.

The German chemist Fritz Haber devised a method for combining the nitrogen of the air into compounds from which explosives and fertilizers could be manufactured. This meant that Germany, during World War I, did not have to depend on nitrates from Chile for its explosives. Because Great Britain controlled the seas, Germany would have been forced out of the war by 1916 if it hadn't been for the Haber process. Haber also headed Germany's program for development of poison gas. When Hitler came to power, Haber was deprived of his job and forced into exile. He was Jewish.

Efforts by German scientists to get top-level Nazi support for development of the atomic bomb were to no avail because Hitler expected a quick victory through conventional weaponry. Construction of the monster bomb would consume a score of years, and by then the Third Reich would own the world.

Secretary of State John Hay, who was also a poet, called the Spanish-American War a 'splendid little war.' The U.S. lost 5,462 men, mostly from disease.

In the supreme Roman army – efficient, well trained, and usually well officered – equipment and role were one time determined by wealth. The richest men wore shield, breastplate, greaves (armor for the leg below the knees) and helmet, and carried sword and spear. The less-wealthy men did not wear breastplates. Poor men were equipped with only a helmet. The poorest men had no armor at all, but carried spear and sword.

England and Portugal have never been at war with each other. It is probably the longest unbroken peace between nations in the world.

When the War Refugee Board urged the U.S. War Department in World War II to bomb the industrial installations and mass extermination equipment at the Nazi concentration camp at Auschwitz, the plea was rejected because it would be 'an unwarranted diversion of planes needed elsewhere.'

Theodosius II built a triple wall from the Golden Horn of the Sea of Marmara, blocking the landward side of Constantinople by a barrier much stronger than any that had existed. The walls were a generation in the construction, 413-47 A.D. On the far side of the walls was a moat, sixty feet wide and twenty-two feet deep, which the enemy would have to swim or bridge in order simply to reach the first wall. Behind the first wall, which was low, archers crouching in perfect security could pick off the attackers. If the moat was passed and the first wall breached, there were the two additional walls to conquer: the middle wall was twenty-seven feet tall, and the third wall was seventy feet tall, from the third, the defenders could shoot their arrows and catapult their stones. Even now, fifteen centuries later, the ruins are impressive.

With both sides willing, the Roman Empire and Persia signed

'The Endless Peace' treaty in 533 A.D. They were back at war with each other within seven years.

Prisoners were exchanged by the Union and Confederate armies during the U.S. Civil War, until Union General Ulysses S. Grant realized that re-manned enemy forces were impeding the ultimate Union victory. He canceled the program.

The development of long stirrups, enabling the rider to maintain a much steadier seat when riding at full gallop, gave the T'ang cavalry a tremendous military advantage. Beginning in the seventh century, the T'ang managed to extend their control from the whole of central China to much of Manchuria in the northeast and Sinkiang in the northwest.

World War II isn't really over. There has never been a formal peace treaty between Germany and the Soviet Union.

General Douglas MacArthur was relieved of his command in 1951 in a dispute with President Truman. Like his father before him, he had openly criticized civilian officials and foreign policy. Although General Arthur MacArthur had risen to highest ranking officer, he never was made chief of staff, and after a policy dispute with President Taft, he retired at 64, a deeply hurt and bitter man.

The parents of Dwight D. Eisenhower, who rose to become one of the few five-star generals in U.S. history, were pacifists.

James Madison was the only President to exercise actively his role as commander-in-chief of U.S. military forces. On August 25, 1814, when British troops were attacking Washington, D.C., during the War of 1812, Madison took

command of Commodore Joshua Barney's battery in Bladensburg, Maryland, in an attempt to protect the capital, which lay a few miles to the south.

The Central American country of Costa Rica, which has a population of more than 2 million people, does not have an army.

The British and French armies in World War I did not advance more than three miles at any point on the western front in the whole year of 1915. The three miles cost the French army alone nearly 1.5 million men.

The Mongol army of Kublai Khan tried to invade Japan in 1281 but was foiled by a hurricane that wrecked their fleet. The invaders who had made it to Japan were massacred. The Japanese named that hurricane *kamikaze*, "the divine wind." In World War II, the term was used for a Japanese suicide air force whose fliers crashed their bomb-laden planes into their targets.

Immediately after the end of the American Revolution, Congress abolished the United States Army, the Navy, and the Marine Corps, leaving the Congress itself the only national governmental organization. The states feared a standing army.

Wars have usually sparked an acceleration in technological skills. In the nineteen century, for example, demand for accurate small arms encouraged the industrial evolution of interchangeable parts and high-speed lathes, new drilling equipment, hardened metals, and new alloys. World War I gave agriculture the tractor via the tank. World War II gave man nuclear energy via the atomic bomb.

In only one battle have elephants been used on both sides. In the Fourth Syrian War, in 217 B.C., Antiochus III of Syria used Asian elephants when he attacked Ptolemy IV's Egyptian army with its smaller elephants of North Africa (which are now extinct). The Asian elephants were the victors, but the Egyptian army went on to win a smashing victory in the engagement at Raphia on the Egyptian border.

Nearly 700,000 land mines were dug up from the banks of the Suez Canal by the Egyptians and the Israelis after their brief but bitter war in October 1973.

On August 15, 1978, thirty-three years to the day after V-J Day, China and Japan signed a 'peace and friendship' treaty, formally ending their part of World War II.

In March of 1889, a German naval force shelled a village in Samoa, and by doing so destroyed some American property. Three American warships then entered the Samoan harbor and were prepared to fire on the three German warships found there. Before guns were fired, a hurricane blew up and sank all the ships, American and German. A compulsory armistice was called because of the lack of warships.

During the Russo-Japanese War, it took Russia's Baltic fleet seven months to sail the 18,000 miles to the Straits of Tsushima between Korea and Japan. It then took the Japanese only a day and a half in May 1905 to effect the most complete naval victory in history. In the straits, the Japanese sank or captured eleven Russian battleships, two coast-defense battleships, nine cruisers, and eleven lesser vessels.

By the time he was killed, by enemy fire, on the quarterdeck of his flagship *Victory* at Trafalgar on October 21, 1805, Admiral Lord Horatio Nelson (five feet, two inches) had

already lost his health to malaria, the sight in one eye while fighting in Corsica, and his right arm in battle at Tenerife.

The U.S. military men on the advisory committee on uranium, convening at the direction of President Franklin Roosevelt in the month after the outbreak of World War II in Europe, agreed that nuclear energy experiments should be done by the universities, not by the federal government. For the purpose of obtaining 50 tons of graphite and 1½ tons of uranium oxide, an appropriation of $6,000 was made.

During World War II, construction of ice-ships was considered. Unlike crude icebergs, these ships would be engineered and metal-clad, enormously strong and especially buoyant. According to the British Association for the Advancement of Science, 'Had not the atom bombs been dropped on Japan and the war come to an end, ice-ships would almost certainly have appeared on the oceans of the world.'

In 1978, the nations of the world spent $800,000 a minute on arms, or an annual total of $400 billion. At the current rate of increase, the figure of $1 trillion per year will be topped by the end of the century.

The Japanese kamikaze pilots of World War II were given privileged treatment and considered to be heroes. All volunteers, they underwent rigorous training that prepared them for their suicide missions. If they refused to stay in the corps, they were shot as traitors.

In their last attempt at European conquest, the Turks took Crete from the Venetians in 1669 and advanced to the northwest, standing in 1683 on the outskirts of Vienna. The Venetians and Austrians counterattacked successfully. The Turks, defending Athens against naval attack, stored

gunpowder in the nearly 2,000-year-old Parthenon. When a Venetian cannonball struck the Parthenon, exploding the gunpowder, the entire center section of one of the most magnificent buildings of all time was destroyed.

By the age of twenty-five, he had been expelled from the army and was disgraced, despondent, without funds, apparently without a future, and suicidal. The man was Napoleon (1769-1821). One year later, he was the youngest general in the French army and began winning victories with ragged troops that were at the point of starvation.

Colonel George Washington of the Virginia Militia was denied a commission in the regular British army in 1754. He resigned his militia commission and became a Virginia planter at Mount Vernon. His resentment of the British over this rejection helped lose George III his colonies.

In September 1942, a Japanese plane flew over Oregon on two occasions and dropped bombs in an attempt to set the forests on fire. The float-equipped plane had been carried across the Pacific by the submarine I-25. It wasn't until many years after World War II that it was revealed that the U.S. mainland had been bombed from the air for the first time. The general public had assumed that the forest fires of '42 were started by firebombs carried in balloons by prevailing winds from Japan to Oregon.

The Crusaders were able to conquer Acre, a coastal town eighty miles north of Jerusalem, in July 1191, only after 100,000 on both sides had been killed.

When Hannibal invaded Italy, in the third century B.C., his military engineers employed fire and vinegar to smash a path through the Alps. The engineers heated immovable rocks with blazing logs, then poured vinegar over the rocks. The

rocks split into fragments that could be pushed aside

During World War II, Japanese soldiers used the remains of crabs so they could read maps at nights without attracting attention. Tiny crabs that produce their own biological lights as the result of enzyme action were dried out and ground into a powder. When water was added to the powder held in the soldiers' hands, a faint blue light was produced.

Joseph Wenzel, Count Radetzky de Radetz (1766-1858), served in the Austrian army for seventy-two years, nearly half of this time as a field marshal. Another long military career was that of Sir Thomas Brisbane (1773-1860), who served in the British army for seventy years, many of them as a general, he was also an astronomer, founding observatories in Scotland and Australia – and governor of New South Wales, Australia. The city of Brisbane in Australia and the Brisbane River bear his name.)

The French general whose name came to mean a strict military disciplinarian – martinet – was killed by gunfire from his own men as he led a charge. General Jean Martinet beat soldiers of Louis XIV into shape by relentless drill, and naturally he became a hated man. (Perhaps his death was an accident.)

By making use of the energy of the recoil of a fired bullet to eject the spent cartridge and load the next, Hiram Maxim in 1884 produced the first fully automatic machine gun.

Marie Joseph Paul Yves Roch Gilbert du Motier, Marquis de Lafayette, feared that 'no one will know me' when he returned to the United States for a visit at the request of President James Monroe in the 1820s. How wrong he was. America's great friend during the Revolution – he had been at Valley Forge with Washington, was wounded at Brandywine,

and helped to negotiate for French aid – was welcomed and acclaimed everywhere. Congress voted him a gift of $200,000 and a township of land.

The Opana radar station of the U.S 55th Signal Aircraft Warning Service near Hawaii's Kahuku Point picked up incoming aircraft at 136 miles, but the privates on duty there were advised by higher-ups at Information Center not to be concerned – they must be U S planes due from the mainland. Radar was a new technology and wasn't entirely trusted yet. The day was December 7, 1941, and the approaching aircraft turned out to be the vanguard of Japan's 'wild eagles' – 353 carrier-based warplanes that were to sink or heavily damage eighteen U.S. warships in Pearl Harbor and kill 2,403 men.

Though Theodore Roosevelt's famous attack in Cuba in the Spanish-American War is referred to as the charge of the 'Rough Riders,' the troops were not mounted.

Though the six-year War of Independence ranged and raged over most of the thirteen colonies, George Washington's Continental Army never consisted of more than 22,000 troops at any one time.

Early guns took so long to load and fire that bows and arrows – in trained hands – were twelve times more efficient.

Several people, including the Secretary of State and the Secretary of the Navy, were killed when the ten-ton gun 'Peacemaker' exploded during a firing from the first propeller-driven warship, the U.S S *Princeton*, on cruise on the Potomac south of Washington in 1844. The survivors included President John Tyler and his fiancée, Miss Julia Gardiner, who were in a cabin below deck at the time of the accident.

The British orders interfering with U S commerce that led to the War of 1812 were actually repealed by Great Britain the day before war was declared by the United States But the U S had no way of knowing this because rapid communications methods such as the telegraph had not yet been invented (the first transatlantic cable was not laid until 1866), so it proceeded with the war as planned

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Without much knowledge of the deeper aspects of the struggle, 30,000 soldiers from Hesse Germany engaged by George III – the Hessians fought against the Americans in the Revolutionary War The colonists did not so much dislike the Hessians recognizing them to be helpless pawns, as they disliked the English king for hiring foreigners to shoot men he considered his subjects

---

Forty years after Commodore Perry opened Japan in 1854, the half-Westernized island kingdom was militarily and industrially strong enough to defeat giant China in a war and take over Formosa, and ten years later was able to defeat Russia, which led to the virtual annexation of Korea

---

The Hundred Years War did not end legally; there was never a peace treaty No English government could bring itself to make peace with France and admit that Crécy and Poitiers and even Agincourt had come to nothing The English would sign a truce only, and that was all the French got

---

While being refitted, in 1782, off Spithead, at the eastern end of the channel between Hampshire and the Isle of Wight, the British man-of-war *Royal George* keeled over under the strain caused by the shifting of 108 guns The commander of the *Royal George*, Admiral Richard Kempenfeldt, and 800 sailors and marines and visitors drowned

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Although the exact figures will never be known, approximate-

ly 500,000 soldiers of the German armies are still missing in action from World War II, and 150,000 German civilians are still unaccounted for, nearly all from air raids. The West German Red Cross tracing service, however, has located or answered doubts about more than 1.2 million soldiers missing in action, and closed the books on 208,000 missing German civilians. The agency has reunited many parents and children separated by the war, but it believes about 3,000 children are still alive and "missing."

At the end of the Spanish-American War, in 1898, the United States occupied Cuba. Rioting mobs in the street, along with outbreaks of malaria and yellow fever, created havoc in the country. Lieutenant James Moss was sent with his troops to maintain order, they were successful. The unique thing about Moss's 25th Infantry of only one hundred men was that they were a bicycle corps - they all rode bicycles, they were all black, and they never once used their weapons while in Cuba.

Napoleon hit on the idea of using a semaphore telegraph – visual messsages from as far as the eye could see - and gained a huge advantage over his enemies. He could send a message from Paris to Rome in four hours.

When Korea refused to do business with the U.S. in 1871, a month-long war erupted, it ended in a draw. American ships sailed off claiming victory. The Koreans declared they had driven the Americans away.

In a single raid on Britain about 1,000 years ago, the Vikings used a fleet of eighty 'dragon ships,' each carrying a hundred soldiers.

After the Battle of Waterloo, June 18, 1815, the British commander-in-chief commissioned Captain William Siborne to supervise the making of a model of the famous site. Captain

Sapporo completed it in 1738 at his own expense when he did not receive the funding he had been promised. On a scale of nine feet to one mile, it measures about eighteen feet square and contains approximately 100,000 figures, each about half an inch high. It is now on display at Whitehall in London.

Despite the antifeminist precepts of Islam, a woman ruled in medieval Egypt and planned the attack against Louis IX (1204-70), and his Crusaders. When the Sultan died during the siege of Cairo, his wife, Shajar-al-Durr, kept his death a secret. Pretending that he was merely ill in the palace, she gave orders in his name and devised the strategy of cutting the Crusader supply lines. The Egyptians won the battle and captured Louis IX, in 1250.

In 1738, Captain Robert Jenkins displayed an ear pickled in brine before a Parliamentary committee in London. He identified the ear as his own, and charged that a Spanish patrol had cut it off while he was sailing in the West Indies. Appalled, the British declared war on Spain – the War of Jenkin's Ear, which expanded into the War of the Austrian Succession.

The British government was advised by Lord Cherwell, Prime Minister Churchill's scientific adviser, that the V-2 rocket was only a propaganda rumor. There was nothing to the stories of a rocket-propelled bomb that the Nazis could send faster than the speed of sound from bases in northern Germany to explode without warning in London and other cities. Hundreds of the V-2 – the German abbreviation for *Vergeltungswaffe 2*, literally, 'reprisal weapon 2' – rocked England until the Allies overran the launching sites.

Five hours after the Japanese had successfully launched a surprise air strike on U.S. bases in Hawaii, in 1941, a message sent through commercial channels was received by the U.S.

Army and Navy commanders there. It was from Chief of Staff General George C. Marshal., in Washington, advising the island defense forces they should be on the alert.

The army of the Netherlands is unionized. Overtime pay for KP and for guard duty on the weekend are among the innovations.

Six U.S. Presidents were professional soldiers: Washington, Jackson, William Henry Harrison, Taylor, Grant, and Eisenhower. Five other professional soldiers were nominated for the Presidency. About thirty-five other Presidential and Vice-Presidential candidates served in the military.

To terrorize their foes in the fifteenth century, Turks used a gun of hooped iron that had to be pulled by oxen and maneuvered by a hundred men. The gun fired half ton stone balls.

In our century, gas and later the atomic bomb were considered too terrible for use in war. The first weapon arousing such dread was the crossbow. The medieval popes tried to have it banned as inhuman (except against infidels). The medieval kings, however, found it too effective in battle against their fellow-Christians to discard it.

The first machine gun was invented during the U.S. Civil War by Richard Jordan Gatling, but it was not adopted till the war was over. It was called the Gatling gun, a phrase that has gone out of fashion. However, the slang term 'gat,' used for a gun and derived from Gatling's name, survives.

The kings of ancient Scythia divided the spoils of victory according to a simple mathematical ratio. Soldiers brought in the heads of the enemies they had killed, and the number

determined the individual's share. Those who produced no heads got nothing.

The rockets mentioned in 'The Star-Spangled Banner' were less effective than bombs. They had a shorter range and were so inaccurate that they had to be abandoned as weapons after the War of 1812. Not until World War II did rockets become important.

On the eve of World War II the U.S. Army ranked, with reserves counted, nineteenth among the world's armed forces. This placed the U.S. after Portugal – but ahead of Bulgaria.

When Louis XIV invaded Holland in 1672 the Dutch cut the dikes and allowed the waters of the North Sea to rush in over their land. Amsterdam became an island inaccessible to the powerful French army which had to retreat from the flood.

The American ships firing steadily at the Spanish fleet in Manila Bay in May 1898, pulled off briefly at one point so that the crews could have a quiet breakfast. On returning to work, they destroyed the enemy.

The famous 'Battle of the Thirty' in the fourteenth century. To avoid depletion of the dwindled resources of the two nations, the English and the French each selected thirty champion soldiers to fight under prearranged rules for possession of a fortress. Under Bertrand du Guesclin, Constable of France, the French won.

Germ warfare was used in the fourteenth century, when a band of Tartars surrounded a group of Genoese merchants who had taken refuge in the walled town of Caffa in the Crimea. After three years of fighting, the Tartars finally achieved victory by catapulting into the village, in addition to

rocks, the bodies of their own soldiers who had died of bubonic plague. The entire town was infected. After the Tartars departed, the Genoese who survived returned home, where they infected their families and contributed to the spread of the Black Death.

The purpose of the Great Wall of China, the monumental fortification separating China from Mongolia, was not especially to keep out the Huns from the north. The Huns could easily find places along the stretch that they could scale with ladders. But they couldn't get their horses across. Without their horses, they weren't very effective conquerors.

A hundred years before the U.S. Declaration of Independence, a rebellion in Virginia overthrew the British colonial government there. Nathaniel Bacon, Jr., led 500 farmers protesting poor frontier security, taxes, and other conditions against the administration of Governor Berkeley. The group marched on Jamestown and took over the House of Burgesses. The revolt ended after Bacon's sudden death from an attack of dysentery. Bacon's rebellion was the first of many settler-vs-government skirmishes that would culminate in the American Revolution.

The British Government asked Michael Faraday if there was any possibility of preparing quantities of poison gas for use on the battlefield in its Crimean War (1853-56) with Russia and, if it were feasible, would he direct the project to perform the task. Faraday's answer was immediate and unequivocal. The project was feasible – and he would have absolutely nothing to do with it.

The first mechanical road vehicle, forerunner of the automobile, was a steam-powered tractor designed in 1769 for pulling cannon. Built by N. J. Cugnot, a captain in the French army, the three-wheeled carriage had a bulky boiler protruding over the front wheel that lead to its description as

'a whisky still on a wheelbarrow.' Its maximum speed was four miles per hour. Eventually, Cugnot drove the vehicle into a wall, earning himself a jail sentence as the first traffic violator on record.

Jean Angot (1480-1551) was a peaceful merchant and shipbuilder in Dieppe, France, until two of his ships were set upon by Portuguese vessels. He became so enraged that he attacked Lisbon with seventeen of his ships. He captured many enemy ships, occupied the harbor, ravaged the surrounding area, and generally blockaded Lisbon until the Portuguese government sued for peace.

Christopher Columbus was a naval mercenary in the service of René d'Anjou, King of Naples, in 1472 and 1473.

During the War of 1812, much of the action took place at sea. The British had the numbers, 800 naval vessels versus the United States' 16. However, the U.S. had three frigates, the *Constitution*, the *President*, and the *United States*, that were faster and better than any British vessel. Because the battles were duels between single ships, the U.S. won many notable victories.

When they would raid Siberia in the months of darkness, the Mongols had an ingenious method for finding their way home in the dark. They would leave at their camp the young foals of their mares. After the raid, the riders would drop the reins, and the mares instinctively carried them straight back to the foals.

In 1971 - the Vietnam war was on, and it was the third year of Richard Nixon's Presidency - nearly 100,000 men deserted the U.S. armed forces.

The Peace of Westphalia, which concluded the Thirty Years

War in 1648, left the Holy Roman Empire divided into more than 300 principalities between the Alps and the Baltic. Each had its own government, army, and treasury Germany remained thus divided, more or less, for two and a quarter centuries.

Brigadier General Smedley Butler, a U S. Marine hero, told the American people via Public Broadcasting Service· 'I helped to make Honduras right for the American fruit companies in 1903 I helped to make Mexico and especially Tampico safe for American oil interests in 1914 I helped to make Haiti and Cuba a decent place for the National City Bank boys to collect revenues in. I brought life to the Dominican Republic for American sugar in 1916. In China, in 1937, I helped to see to it that Standard Oil went its way unmolested. I was rewarded with honors, medals, and promotions. Looking back on it, I feel I might have given Al Capone a few hints. The best he could do was to operate his racket in three city districts. We Marines operated on three continents.' General Butler was noted for his violent opinions and flamboyant quarrels. After his retirement from the marines, he campaigned for isolationism prior to World War II.

Giant kelp, a seaweed of the Pacific, is so rich in potash that the Allies' needs in World War I were met by harvesting it, when German supplies were cut off. (Potash is used for fertilizer, for making glass, soaps, and other important potassium compounds.)

When Spain declared war on the U.S in 1898, the U.S. in turn declared war on Spain but backdated the declaration by three days so it would look more heroic to have declared war first.

The Pentagon, headquarters for the United States Department of Defense, is the world's largest office building - a city

in itself. With an area of 6,500,000 square feet the Pentagon has a Main Street lined with shops, restaurants, a bus depot, and a post office. Commercial rental of the office space would come to more than $20 million a day.

Three of Theodore Roosevelt's four sons were killed serving their country in wartime. Quentin was killed in World War I, and Theodore, Jr., and Kermit died serving in World War II.

Until the mid-1800s, the largest ship built in America was the *New Netherland*, in the 1630's. It carried thirty cannon and displaced some 700 tons.

Cheng Ho, court eunuch and great mariner of the Ming Dynasty, led Chinese fleets on seven voyages of conquest and diplomacy, between 1405 and 1433. As a result of Cheng Ho's voyages – as far as West Africa – thirty-six countries sent tribute to China. But no additional expeditions were organized. The Chinese preferred to let the rest of the world come to them, and eventually they did – to China's regret.

The U.S. warship *George Washington* was captured by forces of the Dey of Algiers in October 1800 and forced to sail under escort to Constantinople. There, the captain and the crew were presented as slaves to the Sultan.

Since the Early Bronze Age, about 5,000 years ago, the seemingly worthless, underpopulated, undercultivated Sinai Peninsula has been the world's most besieged land, the battlefield for at least fifty invading armies on their way to grander prizes in Africa and the Middle East.

Samuel Powhatan Carter (1819-91) was both a major general in the U.S. Army and a rear admiral in the Navy. He organized the first Union Troops from Tennessee during the

U.S. Civil War, and from 1870 to 1873 he was commandant of midshipmen at the U.S Naval Academy, which had graduated him in 1846.

MILITARY SECRETS

Heinrich Albert, the director of German propaganda within the U.S. before the U.S. entered World War I, carelessly left his briefcase on a New York subway train on June 24, 1915. It was at once picked up by American agents who were shadowing him, and was found to contain documents relating to plans for sabotaging American plants that served as arsenals for the Allies. The documents were signed by Franz von Papen, a military attache to the German embassy, and by the ambassador himself.

The Federal Bureau of Investigation captured eight German saboteurs shortly after they had come ashore from a U-boat off eastern Long Island in 1942. Six were executed and two imprisoned. It turns out that one of those imprisoned, the expedition's leader, was an anti-Nazi and had tipped off the FBI. He was promised that he'd be jailed for only six months. He got, instead, a ninety-year prison term.

The Spartans used a staff and a coil of paper to keep military messages from being decoded if they fell into the hands of the enemy. Rolled around the staff, the words fitted together and made sense. Unrolled, the paper was covered with gibberish. Each general had a carefully guarded staff of precisely the same diameter around which to roll the paper and read the message.

By the end of World War II, there wasn't a German spy in Great Britain who was not under British control. All either were cooperating with the British while maintaining their

German 'alliance' or had been caught and 'turned around.'

The 'King's Secret' of Louis XV was a covert diplomatic corps of which the French foreign minister knew nothing. Louis communicated with other governments through secret agents, often contradicting the foreign minister and causing chaos in French diplomacy – one reason for the French disasters during the eighteenth century.

Radio echoes helped to win the Battle of Britain. Using a radio-echo principle – radar – the outnumbered Royal Air Force always seemed to the puzzled Nazi pilots to be lying in wait at the right time and never to be surprised.

The first U.S. Secretary of Defense, James Forrestal, was confined to an upper story of Walter Reed Army Hospital, in Washington, D.C., in 1949, after physicians had diagnosed him as paranoid. He believed that he was being tracked by secret agents of Israel. As he was not properly supervised, the Secretary jumped to his death from a window. It turned out that Israeli agents had indeed been following Forrestal, in their need to know if the U.S. was making secret arrangements with Arab nations.

So that the patent could be kept secret and the knowledge would not be misused, the atomic scientist Leo Szilard assigned to the British Admiralty in 1934 the patent that first outlined the concept of a chain reaction. The patent was not published until after World War II.

During World War II, the Federal Bureau of Investigation secretly established a house of male prostitutes in New York's Greenwich Village. The house was staffed with multilingual agents for the purpose of extracting important shipping

information from foreign sailors. The FBI later claimed it had been a very successful operation.

To bemuse Axis agents about the imminence of a cross-Channel Allied invasion of Nazi-held Europe, an actor posed as British Field Marshal Bernard Montgomery and conspicuously visited North Africa.

Bismarck tricked the French into the Franco-Prussian War by altering a telegram from the King of Prussia. He truncated the king's conciliatory words so that the telegram sounded belligerent. The result was what the Iron Chancellor intended, a French declaration of war, followed by a German victory.

During World War II, the U.S. Navy had a world champion chess player, Reuben Fine, calculate – on the basis of positional probability – where enemy submarines might surface. Dr. Fine says, "It worked out alright."

Novelists sometimes go to great lengths in personally experiencing realistic details to enhance the immediacy in their art. Frederick Forsyth may have topped them all. When his novel *The Dogs of War* appeared in 1974, few readers knew that this tale of a group of mercenaries who overthrow an African government was based on Forsyth's own attempt to do just that – to overthrow, with the help of thirteen men, the government of Equatorial Guinea by kidnapping its President, Francisco Macías Nguema, in 1972, an attempt on which Forsyth had spent $200,000. But – unlike his fictional mercenary, Cat Shannon, in the mythical country of Zangaro – Forsyth failed in Equatorial Guinea when a Spanish co-conspirator did not come through with the ammunition. All of Forsyth's books – which include *The Day of the Jackal* (about an attempt to kill De Gaulle) and *The Odessa File* (on S.S. leaders still at large) – are so meticulously researched

that they often read like how-to manuals rather than novels. His U S publishers, The Viking Press and Bantam Books, could not have been too surprised to learn of Forsyth's Equatorial Guinea caper when the London *Times* and *The New York Times* broke the news, in 1978.

The Navajo language was used successfully as a code by the U.S. in World War II.

Mata Hari, the Dutch-Javanese dancer who became the most famous spy of World War I, ordered that a suit be especially tailored for her for the occasion – execution by a French firing squad She also wore a pair of new white gloves.

During World War I, one of England's greatest novelists, W. Somerset Maugham, worked around the world for British intelligence He was an agent in the South Pacific, America, and Switzerland He went to Russia to persuade the Russian government to carry on the war against Germany.

An authentic 'lost weapon' is Greek fire, which the Byzantine Empire used on several occasions between the seventh and ninth centuries to defend Constantinople against attacking Muslims Constantinople might have fallen but for Greek fire, and conceivably the Muslims might have taken over a weak and divided Europe To this day, we don't know exactly what the "recipe" for Greek fire was All we know is that is burned all the more fiercely when wet, and that it could be floated toward the enemy's wooden ships.

Ciphers and codes have been used since ancient times, but effective methods for breaking them have developed only in modern times. One of the early cryptanalysts was a French mathematician, Franciscus Vieta (1540-1603 He deciphered the code that Philip II of Spain was using. Philip, who was at war with France at the time, could not understand how his

secrets were leaking to the enemy and he accused the French of sorcery. What's more, he carried his accusation to the Pope.

The Allies learned detailed plans of German fortifications along the coast of France in late 1943 - seven months before they invaded Normandy - and of the supersecret rocket bases at Peenemunde and Friedrichshafen. The Allies' secret? They had broken the Japanese code and were able to learn the content of a thirty page message transmitted to Tokyo by Japanese Ambassador Hiroshi Oshima after he had toured the Germans' defense works.

When the second atomic bomb was dropped on Japan, in 1945, the United States had only one more atomic bomb in reserve. But the second attack convinced Emperor Hirohito to surrender. He had concluded that the first bomb, on Hiroshima, was not a fluke, and that the U.S. could produce more of the terrible weapons.

Secret codes and ciphers are thousands of years old. Many prominent persons throughout history have written in ciphers for diplomatic and military reasons; they include Julius Caesar, Charlemagne, Alfred the Great, Mary Queen of Scots, and Louis XIV.

During the time that the atomic bomb was being hatched by the U.S. at Alamagordo, New Mexico, applicants for routine jobs like janitor were disqualified if they could read. Illiteracy, in other words, was the word of the day. The reason? The authorities didn't want their trash or mislaid plans read.

William Penn, the Quaker pacifist, was the son of a renowned fighting man, Admiral William Penn. The admiral took part in battles under Cromwell against the Dutch and Spaniards,

helped capture Jamaica, and was knighted for supporting the Restoration of Charles II. The admiral never could convince his son that pacifism was wrong, nor did the son's beliefs affect the father.

MISCONCEPTIONS

Samuel F B Morse did not really invent the telegraph He managed to get all the necessary information for the invention from the American physicist Joseph Henry, and later denied that Henry had helped him. Henry easily proved the contrary in a court trial Morse was a good promoter, and squeezed $30,000 out of Congress for building the first telegraph line, from Washington to Baltimore, in 1844 He did, however, invent the Morse code

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The Pilgrims did not build log cabins, nor did they wear black hats with a conical crown and a hatband with a silver buckle

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James Watt did not invent the steam engine; Thomas Newcomen did, in 1712 By 1778, more than seventy Newcomen engines were pumping away in the mines of Cornwall alone When Watt was asked to repair a Newcomen engine, he devised a modified engine that was much more efficient and that could be used to turn wheels This modified steam engine was so useful that the earlier Newcomen engine was soon forgotten.

The famous painting by Emmanuel Leutze titled "Washington Crossing the Delaware" is false in almost every historical detail. Among the misrepresentations are the American flag, which was not adopted until after the event, and the size of the boat, which actually was much larger

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An absurd fiction of history is that when Columbus said the world was round, everybody else thought it was flat During the debates at the court of Queen Isabella, the true shape of the Earth was never an issue, its size was. The opponents of

Columbus said he was underestimating the size, and that he could never sail due west from Europe to the Orient. They were right. Except for the accident of an unknown continent in between, Columbus would either have turned back or been lost at sea.

Lloyd's of London, the best-known association of insurance underwriters, does not write life insurance.

"The doctrine that the Earth is neither the center of the universe nor immovable, but moves, even with a daily rotation, is absurd, and both philosophically and theologically false, and at the least an error of Faith." This was the wording of the Roman Congregation's decision against Galileo.

Albert Einstein, who was awarded the Nobel Prize for physics in 1921, was honored not for his famous theory of relativity published sixteen years earlier, but for his lesser-known work on the photo-electric effect.

Most of us learned in school that the Magna Charta was signed in 1215 by King John. But it was not – the monarch could not write his name. He granted the Magna Charta by placing his seal on it.

A popular misconception seems to be that filtered cigarettes are less dangerous than unfiltered ones. According to a study conducted by Dr. G. H. Miller at Edinboro State College, Pennsylvania, the opposite would be the case: people who prefer filtered cigarettes are in danger of dying two to almost four years earlier than smokers of filterless cigaretts. Filters prevent the dilution of the smoke by oxygen so that the bloodstream builds up higher levels of carbon monoxide, in the form of carboxyhemoglobin. One of the effects is greater damage to the cardiovascular system, with the danger of strokes and heart attacks. Approximately 50 percent of the

deaths studied resulted from heart attacks and about 20 percent from cancer.

Until the time of Galileo an argument often used with potent effect was that if the Earth moved, and if it indeed rotated on its axis, the birds would be blown away, clouds would be left behind, and buildings would tumble.

President George Washington's often quoted and referred-to Farewell Address was never delivered orally. The address — which was composed with the help of James Madison and Alexander Hamilton — was merely published, in the Philadelphia *Daily American Advertiser*.

St. Patrick (ca. 385-461 A.D.) was not Irish. He was British, probably Welsh, and never saw Ireland until kidnapped by Irish raiders. After his escape, he became a priest and a bishop and returned to Ireland as a missionary. His success made him the patron saint of Ireland.

Robert Fulton did not invent the steamship. Seventeen years before Fulton's first ship sailed up the Hudson River, John Fitch maintained a regular steamship schedule on the Delaware River between Philadelphia and Trenton. Financial difficulties and various misfortunes made Fitch's business venture a failure, but it was he who invented the steamship.

There are no statistics to indicate the concentration of land ownership in the U.S., and there has never been a land census. Information about size of farms is obtainable from the Department of Agriculture, but nobody knows the identities of the people who own the land, or how much land they own.

Henry Hudson cannot be credited with the discovery of the river that bears his name because it was not until September

1609 that he sailed the *Half Moon* into the river. In 1525, the Portuguese Estevan Gomez had entered the 'Hudson' at what is now New York Harbor. Later, a letter was found from the Florentine Giovanni da Verrazano relating the details of *his* being there first, in March 1524. (Verrazano's report, however, may have been plagiarized from Gomez's, there is no *proof* that Verrazano ever made such an expedition.)

The most exciting cartographic discovery in this century turned out to be a forgery – the infamous Vinland Map, 'proof' that the Vikings had explored the New World. An anonymous buyer paid $1 million for three antique items, including the map then thought to be authentic, and donated them to Yale University. Before the Vinland Map was found to be a fake, 10,000 people had paid Yale $15 each for a copy. The map was supposed to have been drawn in the 1430s or 1440s by a monk in Switzerland. Chemical tests showed that the ink used to draw it could not have been made before the 1920s. The other two items, a thirteen-century narrative of a Central Asian voyage and a fragment of a medical encyclopedia of the same period, were authentic antiques.

Charles Darwin rarely used the term 'evolution.' It was popularized by the English sociologist Herbert Spencer, who also popularized the phrase 'survival of the fittest.'

Robert Fulton did not call his steamboat *Clermont*, the name by which it is known in history books. The vessel that inaugurated passenger service between New York and Albany in 1807 was registered as the *North River Steam Boat*. Her sailing port was Clermont, New York.

About the first thing any high-school chemistry student learns in lab is how to light his Bunsen burner, a gas burner used to heat solutions of chemicals. The Bunsen burner was

not, however, invented by the German scientist Robert W Bunsen He merely popularized its use

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The strongest opposition to electoral reform in England in the mid-1800s came not from the rich but from intellectuals opposed in the name of education and intelligence to mass rule.

Englishmen of the sixteenth and seventeenth centuries believed that no one who lay upon feathers could die in peace Therefore, when death approached, the pillow was withdrawn from under the dying person's head to ease the passing.

Because of the story in Genesis that Eve had been created out of Adam's rib, it was widely believed during the Middle Ages that men had one rib fewer than women

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An ordinary TNT bomb involves *atomic* reaction, and could be called an atomic bomb What we call an A-bomb involves *nuclear* reactions and should be called a nuclear bomb

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In eighteenth-century London, Jonathan Wild protected his vast criminal activities by joining up with the law Wild ran an organization of thieves, owned warehouses, depots, and even a ship for illicit trade with the Continent At the same time, he was an officer of the law who arrested criminals independent of his organization The authorities were amazed when their trusted representative was nabbed red-handed Wild's career and execution are chronicled in *The Beggar's Opera*

As late as the Victorian era, many English parents believed a sucking baby absorbed moral character as it took in milk Therefore, if the mother could not nurse her own child, selection of the proper wet nurse became of major importance If the wet nurse were a drunkard or fool, the

parents feared their child would become one as well

When the colonists first arrived in America, some of them believed that the Indians were descended from the ten lost tribes of Israel. In London, in 1650, the Reverend Thomas Thorowgood published a book entitled *Jews in America, or Probabilities that the Americans are of That Race*, in which he pointed out what he saw as similarities between Indians and Jews, such as their customs and their language

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Despite its reputation, the 'man-eating' giant clam of the South Pacific Ocean – which grows to more than four feet across and can weigh a quarter-ton – feeds only on microscopic organisms that the tide washes into its maw.

The Cape of Good Hope is *not* the southernmost tip of Africa About 160 kilometers east of the Cape of Good Hope is Cape Agulhas, which extends 65 kilometers farther south than Hope.

To protect woolens from moths, people for generations have stored them in cedar chests or have built closets lined with cedar. There is no evidence that a cedar chest or closet repels moths.

A person's hair cannot turn white overnight because of some terrible tragedy or frightening experience – or for any other reason.

Contrary to popular belief, the lantern that was hung from the steeple of Boston's Old North Church the night before the American Revolution began was a message *from* Paul Revere, not *to* him He had the lantern lit as a signal to patriots across the river in Charlestown that he had not yet left Boston to meet with them The light served as an advance warning that a British expedition was about to set out, but it provided no

details; these would be supplied when Revere reached Charlestown.

It is not easy to kiss the 'Blarney Stone.' Triangular in shape, it is some twenty feet from the top of a castle wall in the Irish village of Blarney. The only way to reach and kiss it is to hang downward in a most dangerous manner.

The almost universal impression of the 'prairie provinces' of Canada – Manitoba, Saskatchewan, and Alberta – as an endless expanse of wheat fields could not be more erroneous. The notion derives mostly from the fact that the Trans-Canada Highway and the Canadian Railways cut through the dullest parts of these provinces. Manitoba has more than 100,000 lakes and 400 miles of seacoast on Hudson Bay. At Cypress Hills in Saskatchewan there are mountains 4,500 feet high – just 35 miles north of the U.S. border – and near Prince Albert, in the center of the province, there is a 1,500-square-mile forest wilderness of lakes, streams, and hills. The Canadian Rockies belong as much to the western border of Alberta as they do to British Columbia.

Most people whom you ask will say that the Atlantic Ocean (the Caribbean Sea) is at the eastern end of the Panama Canal and that the Pacific Ocean (the Gulf of Panama) is at the western end of the canal. Take a look at a map. If you enter the canal from the Atlantic side, you enter in the western and you leave at the eastern – the Pacific – side.

The family legend that made Betsy Ross famous was first told thirty years after her death. A grandson claimed that she had been visited in June, 1776 by a secret committee, which included George Washington, that asked her to design and sew a flag for the new nation. There is no evidence to corroborate the story. Elizabeth Griscom Ross – 'Betsy' – was merely the seamstress. The original American flag was designed by Francis Hopkinson of New Jersey. He was a

lawyer, author, artist, member of the Second Continental Congress, the first native American composer, and signer of the Declaration of Independence.

Euclid worked out virtually none of the theorems of 'Euclidean' geometry. He was a collector of other men's works. His great virtue was that he arranged in so logical an order the geometrical theorems known in his time that they can scarcely be improved on.

The Incas, experts at organization and engineering, did not have wheels, arches, or writing. At the height of their power, before the Spanish conquest in 1532, the Incas ruled the entire area in South America from Quito, Ecuador, to the Rio Maule, Chile Their empire was centered at Cuzco, Peru.

Benjamin Franklin's invention of the lightning rod in 1753 was the first practical victory of science over a natural phenomenon Two years later, when Lisbon, Portugal, was destroyed by an earthquake and tidal wave, some ministers in Boston proclaimed it was a punishment for the sacrilege of using lightning rods to avert the wrath of God.

In the 1520s a Spanish force of 600 men led by Hernando Cortez with horses and guns overturned an empire of 2 million that had neither horses nor guns. Cortez landed in Mexico, gaining allies among the enemies of the Aztecs, and marched on Mexico City, where the local legend of 'the pale god from over the sea' overawed Montezuma. Cortez, after having the Aztec emperor murdered, took control of the Aztec Empire with his handful of men.

One of the first to speculate on evolution was the French naturalist Georges de Buffon (1707-88). He thought of it as a downhill slide, however. He thought an ape had degraded from a man, a donkey from a horse, and so on.

Chester Carlson, the inventor in 1937 of xerography, the dry copying process, could also have been the inventor of another important communication tool if he hadn't given up. Carlson had an idea for what later became the ball point pen, but he dropped work on the concept long before it was marketed. He thought the pen wouldn't work.

Sir Edmund Hilary and Tenzing Norkay deservedly received much praise when they were the first to climb to the summit of Mount Everest. Less known is the fact that they had a roster of twelve climbers, forty Sherpa guides, and 700 porters.

Galileo was forced to resign as a teacher at the University of Pisa when he gainsaid Aristotle's long held thesis that the heavier a stone, the faster it falls. It is now acknowledged that two stones of unequal weight that are dropped from a tower at the same time will strike the ground at the same time.

A nonexistent monarch contributed to the opening of Europe's Age of Discovery. In the fifteen century, Prince Henry the Navigator dispatched his sea captains on voyages to explore the African coast. One of Henry's hopes was that his men would blaze a route around the continent and negotiate an alliance against Islam with the powerful king of Ethiopia known as 'Prester John.' The Portuguese rounded the Cape of Good Hope and sailed the east coast of Africa, only to find that Prester John did not exist.

The rules of the game of reason say the question is meaningless and requires no answer. The question, 'What would happen if an irresistible force met an immovable body?' In a universe where one of the above conditions exist, by definition the other cannot exist.

You won't get a bellyache from eating a green apple, as long as

you chew it completely The stomach doesn't know the difference between ripe and unripe apples

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According to legend, it was the cowboy and the six-gun that won the West Actually, it was the steel plow, barbed-wire fencing, and the portable windmill that made it possible for pioneers to settle there.

Carolus Linnaeus, the Swedish botanist who was the first to classify most living things, stubbornly fought the idea of evolution. He insisted that all species were created separately, that no new species had been formed since Creation, and that none had become extinct About a century later, in 1858, the seminal work by Charles Darwin and Alfred Russel Wallace on the theory of evolution appeared in the *Journal of the Linnaean Society* – articles Linnaeas no doubt would have objected to if he had still been alive.

Robert Darwin was strongly opposed to his son Charles going on the five-year around-the-world expedition of the *Beagle* He saw Charles once again shifting his sights – this time away from the Church – and drifting, he thought, irretrievably into a life of sport and idleness.

Everyone in the Middle Ages believed – as Aristotle had – that the heart was the seat of intelligence.

In order to test whether acquired characteristics could be inherited, the German biologist August Freidrich Weismann cut the tails off twenty-two generations of mice soon after birth and found that each one nevertheless continued to give birth to mice with full-sized tails. No one knows why he bothered. If he'd stopped to think, he'd have realized that more than twenty-two generations of Jewish boys have been circumcised soon after birth, and each newborn Jewish boy comes into the world with a full-sized foreskin.

After World War II England was offered the Volkswagen business as part of reparations but declined, believing that cars with engines at the back had no future. British occupation authorities, however, placed an order for 20,000 of the beetles to help put the VW company back on its feet. By 1959, the company was producing nearly 4,000 cars every day.

Contrary to popular belief, there is little scientific evidence that the ages at which parents die have any correlation to the life span of their offspring, according to studies made at Duke University Center for the Study of Aging and Human Development.

The most popular exhibit in the 1939-40 New York World's Fair was the General Motors exhibit with its Futurama predictions of America in the 1960s. Federal laws forbid wanton cutting of wooded hillsides. People do not care much for possessions. Two-month paid vacations. Cars are air-conditioned and cost as little as $200. The happiest people live in one-factory villages.'

A perpetual-motion machine would violate the laws of thermodynamics. Nobody has succeeded in producing one, nobody ever will.

Karl Marx expected that his economic ideas in the *Communist Manifesto* and in *Das Kapital* would have their greatest impact on the advanced nations of the West. The nation on which he thought they would have the least influence was Russia. (*Das Kapital* was translated into Russian before English.) They indeed led to modern socialism and communism – in Russia.

'While any cabinet headed by Herr Hitler suggests a highly precarious undertaking, the experiment to make him chan-

cellor ... might be tried out to curb Nazi truculence.' – a report in *The New York Times*, January 29, 1933. In Germany and in other countries, many liberals, welcoming the cabinet, reasoned that Hitler had been removed from the street and saddled with the responsibilities of office in a setting that would 'severely circumscribe his liberty of action.' Most German politicians expected him to hang himself with his own rope and be out of office within six months, with his party discredited.

The temperamental captain of the *Beagle*, Robert FitzRoy, studied physiognomy, and nearly rejected Charles Darwin as the ship's naturalist because of the shape of his nose. FitzRoy was not certain that anyone with such a broad, squat nose could have the character and determination to survive a difficult several-year journey.

Prince Henry the Navigator never navigated the seas on exploring expeditions. Henry was given this title because he ran an exploration institute at Sagres, Portugal, where astronomers, geographers, admirals, and shipbuilders pooled their expertise for voyages along the African coast that culminated, long after Henry's death, when Vasco de Gama rounded the Cape of Good Hope and went on to reach India, in 1497.

In and around Zion, a little town in Illinois, on the shore of Lake Michigan about forty miles north of Chicago, there are hundreds, perhaps thousands, of people who believe the Earth is not round. They are the supporters of a theory, proposed in the early 1900s by Wilbur Glenn Voliva, that the Earth is flat. There are also people today who believe the world is hollow and open at the poles. There are some who even believe the Earth is on the inside of a hollow sphere.

Chevalier d'Éon de Beaumont (1728–1810) was a French secret agent whose first mission took him to the Russian

court, where he reputedly disguised himself as a woman in order to gain the confidence of the Empress. He served his country more openly in the army and as a diplomat in Russia and England until he became involved in a public quarrel with his superior and refused to accept his own recall or surrender his papers. When he did return to France the government insisted on his wearing female dress, and he was thereafter known as the Chevalière d'Eon.

MODERN LIVING

Americans spend more time at shopping malls than anywhere outside their homes and jobs. Shoppers can buy anything from diamonds to yogurt there, go to church or college, register to vote, give blood, bet, work, and meditate. In some malls, one can move into a motel room, apartment, or condominium. The Chicago Symphony can be heard at the Woodfield Mall near Schaumberg, Illinois, the Dallas Symphony was on the verge of expiring before a series of successful concerts at North Park Shopping Center revived it. Approximately $60 billion is tied up in American shopping centers, which do about half ($300 billion in 1977) of all retail business. Women meet prospective lovers in shopping malls far more than they do in singles bars.

About 1250, the English scholar Roger Bacon pointed out that the year in the Julian calendar, then in use, was a trifle too long, the vernal equinox came earlier and earlier every year. It took only 300 years for the Western world to make the necessary change to the corrective Gregorian calendar now in use. Russia made the change only after the communist revolution.

Thanks to the electric light, Americans today, on the average, sleep 1½ hours less each day than Americans of six decades ago. A University of Florida report noted that most adults sleep 7½ hours a day and that about 15 percent sleep less than 6½ hours.

Less than a century after Karl Marx died, more than a billion human beings live under governments that consider themselves adherents of his economic theories.

In many countries, urine was used as a detergent for washing (One of urine's major components, ammonia, is used in cleaning products

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Tooth decay in Britain is so severe that it is expected that four out of ten adults will soon have false teeth Consumption of sugar, four pounds per capita in 1845, is now well over a hundred pounds per capita

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Dorothy Levitt, pioneer motorist wrote in her book *The Woman and the Car*, in 1906, that lady drivers should carry a hand mirror in the tool chest under the driving seat It could be used for 'repairing' her makeup after a drive, and for holding aloft occasionally to see what traffic was behind her

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MODERN TECHNOLOGY

The U.S. could have launched a satellite before the Russians launched *Sputnik* A U S. Army rocket launched from Cape Canaveral on September 20, 1957, could have achieved orbital speed easily. Due to government orders, the last stage was an empty dummy, so it did not have the fuel and thrust for orbit. It took Wernher von Braun's team only eighty-four days to ready a satellite for Earth orbit once the command to do so was given.

A device invented as a primitive steam engine by the Greek engineer Hero, about the time of the birth of Christ, is used today as a rotating lawn sprinkler.

The largest light bulb was a foot-long 75,000-watt bulb hand-blown at the Corning Glass Works to celebrate the seventy-fifth anniversary of Thomas Edison's invention of the incandescent lamp.

When the first escalator, or 'inclined elevator,' was installed in the department store Harrod's in London (near the turn of the century), brandy was served to passengers who felt faint.

So that its cars will better handle U S. roads, the British auto maker BL Ltd. (formerly known as British Leyland) has reproduced in its car-testing track near Coventry some of New York City's potholes. Plaster casts were made of the wheel-crackers and used in the design of the test track

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The more an organism has to do, the more complex it is and the more genetic information it needs. A bacterium, which is

single-celled, has little genetic information An alga, such as seaweed, has a good deal With preprogrammed instructions in their computers amounting to a few million bits, the Viking landers that searched for life on Mars had, by analogy slightly more 'genetic information' than a bacterium but significantly less than an alga

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During the building of the Central Pacific portion of the transcontinental railway over the Sierras, three locomotives and forty cars were dismantled and hauled over the mountains on sledges and logs, a feat comparable with the crossing of the ice clad Alps by Hannibal and his armored elephants.

Scientists have been measuring the speed of light for three centuries, and they have it down to an accuracy of half a foot per second The speed of light is 186,282 3959 miles per second.

Coal dust sprayed by aircraft over Russian fields absorbs the early spring sunshine The resulting warmth melts the snow a little sooner.

It is believed that 90 percent of all scientists who have ever lived are alive now, and that as many scientific papers have been published in the years since 1950 as were published in all the centuries before 1950

They could travel by themselves to their destination They could move around easily within certain areas They could work, marry, set up a household 'They' were prisoners in Siberian exile under czarism, and it was indeed a uniquely Russian form of punishment The effective walls of the 'prison' the frozen wastes around them (One of the men who married in Siberian exile was Lenin His wife also had been exiled for revolutionary activity)

Honey is used as a center for golf balls and in antifreeze mixtures.

In order for the film to be processed, the first Kodak hand cameras had to be returned with their exposed film still in the camera. A reloaded camera and prints from the processed film were later sent to the owner. George Eastman devised the Kodak camera in 1888 and founded the Eastman Kodak Company in 1892.

A chip of silicon a quarter-inch square has the capacity of the original 1949 ENIAC computer, which occupied a city block.

Scientists can condense matter to greater densities and temperatures than those at the center of the sun. Fusion-energy research at Lawrence Livermore Laboratory in California uses twenty laser beams to concentrate on targets so tiny that dozens can be gathered on the head of a pin. The system is named SHIVA, after the oldest name for God in the Hindu religion.

When oil was discovered in the United States, in 1859, gasoline was a useless by-product. It remained so until the development of automobiles. In the early days, far more attention was paid to such by-products as cylinder oil and engine oil (both lubricants), kerosene, naphtha for cleaning, petroleum jelly for ointments, and paraffin. The first commercial product made from petroleum was rock oil, sold at $1 a bottle as a cure for cholera, corns, toothache, and neuralgia. In 1870, one company turned 70,000 pounds of paraffin into chewing gum.

In 1920, a Detroit policeman named William L. Potts worked out an electric light system that allowed him to control three street intersections from one tower. He picked the colors red, yellow, and green because railroads used them. These were the first street traffic lights.

In the late 1920s, police in California raided a small laboratory where they thought a scientist, Philo Taylor Farnsworth, was putting together a still for the making of illegal whiskey. They found, instead, that Farnsworth was making a television set. Development of home television was delayed by World War II.

Two identical computers, programmed in the same manner, were on board the Viking lander, the vehicle that descended from the Viking spaceship, landed on Mars and processed soil samples there before the miniaturized automated laboratory touched down on Mars, however, complications arose because the two computers were giving different signals. Another computer back on Earth administered an intelligence test to the pair and turned off the "dumber" one.

Until the 1850s, shoes were made by hand and most were "straight"—they could be worn on either foot. There were two widths: fat and slim, most Americans wore slim. The concept and production of left and right shoes came in with machines.

Assembly-line methods made it possible for the U.S. shipyards of Henry J. Kaiser during World War II to produce **a ship in just four days.**

The greatest steady pressure ever recorded in a laboratory is 25.2 million pounds per square inch, which is 700 times the pressure exerted on the Earth's crust by Mount Everest. This pressure, when applied to diamonds, makes them slowly flow **like liquid plastic.**

Russia built more than 10,000 miles of railroad between 1896 and 1900, the Trans-Siberian driving steadily eastward regardless of the cost. Thirty-two tunnels were smashed **through mountains.**

As long ago as 1820, a prefabricated house was shipped to Hawaii by pious Bostonians wanting to ease the life of missionaries living on the far-off Pacific island

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Charles M Schwab, on leave from his job as chairman of the board of Bethlehem Steel, performed great production 'miracles' in the last year of World War I When he was director general, the U S Shipping Board's Emergency Fleet Corporation once launched a hundred vessels on a single day.

When the steamship *Great Eastern* was launched on the Thames in London, in 1858, she was five times the size of the biggest vessel afloat – 693 feet long, with 22,500 tons displacement The ship was built to carry 4,000 passengers, almost twice as many as the *Queen Mary*, launched seventy-seven years later. The *Great Eastern* could carry 15,000 tons of coal, which would allow her to steam around the globe without refueling.

The largest single industry in the Renaissance world was the Venetian shipyards Fifteen thousand men worked there and a hundred ships could be built or repaired at the same time This was the backbone of Venice's maritime trade and of her supremacy on the high seas from the end of the fifteenth to the seventeenth centuries.

F O Stanley, who with his twin brother F. E. Stanley, invented the steam-powered automobile, drove one of the vehicles to the top of 6,288-foot Mount Washington, New England's highest peak, in two hours and ten minutes, in 1899. Four years later, the first gasoline-driven car managed to get to the summit in a little less than two hours The following year, F E Stanley took a new-model Stanley Steamer up the mountain in twenty-eight minutes.

The highest man-made temperature – 70 million degrees Celsius – was generated at Princeton University in a fusion-power experiment in 1978.

A machine has been invented that can read printed English books aloud to the blind, and it can do so at speeds half again as fast as normal speech. Named for its inventor, the Kurzweil Reading Machine uses an electronic camera to scan printed material in virtually any typeface. It feeds these images into a mini-computer that recognizes each letter, groups the letters into words, computes pronunciation and stress, and, with dazzling speed, produces synthetic speech. The machine has an "accent," but it is readily understood by its user.

MONUMENTS AND PLACES

The Taj Mahal, one of the world's most beautiful buildings, was scheduled to be torn down in the 1830s so that its marble facing could be removed and shipped to London for sale by auction to the landed English gentry. Wrecking machinery was moved into the garden grounds and work about to begin when word came from London not to proceed. The first auction of marble facades of Indian monuments and edifices had been a failure, and it would not be worth it to tear down the two-hundred-year-old mausoleum.

The famous Crystal Palace was the star attraction of the great London International Exhibition of 1851. It was made of 1 million square feet of glass, 33,000 columns, and 2,300 girders, all prefabricated and almost all interchangeable. It contained 100,000 exhibits and was visited by 6 million people during the Exhibition year. The building was removed in 1854 to Sydenham. It was damaged by fire in 1936, and in 1941 its demolition was ordered because it could serve as a visible ground guide for Nazi bombers.

The foundations of the great European cathedrals go down as far as forty or fifty feet. In some instances, they form a mass of stone as great as that of the visible building above the ground.

Egyptians lived an average of only thirty-five years, yet constructed pyramids, each of which took at least twenty years. The average Parisian in the Middle Ages lived only forty-five years, yet the city built the great cathedral of Notre Dame, which took 137 years. The U.S. space program that put men on the moon consumed only one-sixth of an adult lifetime.

The Canal du Midi – also called the Languedoc Canal – which cuts through southern France and connects the Atlantic with the Mediterranean, was built single-handedly, so to speak, by a public official and self made engineer who financed the canal entirely with his own money when public funds were not made available This devoted man was Pierre Paul, Baron Riquet de Bonrepas He died from overwork, in 1680, while supervising the final tasks The canal opened the following year and has been in use ever since The *Encyclopedia Britannica* calls it 'the greatest civil engineering project in Europe from Roman times to the nineteenth century'

The Tower of London, for which construction was begun in 1078 by William the Conqueror, once housed a zoo It also has served as an observatory, a mint, a prison, a royal palace, and (at present) the home of the Crown Jewels

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The great cathedral of St. Sophia at Constantinople (Istanbul) has sustained for 1,600 years what was until very recent times the largest self-supporting dome ever constructed Moreover, it has done so in an active seismic region

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While Columbus was seeking new worlds to the west, Italian engineers were rebuilding the Kremlin in Moscow

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The height of the 984-foot-tall (usually Eiffel Tower varies, depending on the temperature, by as much as 6 inches

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NUMBERS AND STATISTICS

The Swiss mathematician Leonhard Euler was the most prolific mathematician in history. He went blind in 1766, but that didn't stop him, and scarcely slowed him down, for he had a phenomenal memory and could keep in mind computations that would fill several blackboards. He published 800 papers, some of them quite long. At the time of his death he left enough papers in manuscript to keep the printing presses busy for thirty-five years before the last of them was published.

The number of atoms in a pound of iron is nearly five trillion trillion: 4,891,500,000,000,000,000,000,000.

In the 1830s, more than a hundred years before the first generation of modern computers, Charles Babbage, the English mathematician, designed an 'analytical engine' that would perform the four major functions of human computing: carrying out arithmetic operations, having a memory, making a choice of computing sequence, and being capable of numerical input and output. Steam-powered, the machine was designed to store a memory of 1,000 fifty-digit numbers; it was to work with punch-card entry, final results were to be printed automatically and set in type. When the machine required further values for calculations in progress, its operator would be summoned by a bell. Lack of money prevented its development.

Manhattan Island from end to end is less than 1 million inches long. One can walk from New York to Boston in less than 1 million steps. The secretary who goes off for eleven days to the mountains had best hurry – she has less than 1 million seconds to enjoy herself.

The Greeks considered the number 6 to be the first 'perfect number' because it is the sum all its divisors except itself That is, 6 is divisible by 1, 2, or 3, and 1 + 2 + 3 = 6 In the more than 2,000 years that elapsed between the time the Greeks made their determination and 1952, when computers were first used for this purpose, mathematicians discovered only eleven more perfect numbers We now know twenty four (The highest has 12,003 digits)

Designers of the U S $1 bill apparently had no superstitious fear of thirteen On its back is a pyramid with thirteen steps The motto above it, *annuit coeptis*, has thirteen letters *E pluribus unum*, written on the ribbon in the eagle s beak also thirteen letters There are thirteen stars over the eagle s head, thirteen stripes on the shield, thirteen war arrows in its left talon, and an olive branch with thirteen leaves in its right But you see, there were thirteen original states, and that made the number lucky.

The modern decimal position system, in which the placing of numerals indicates their value (units, tens, hundreds) was the invention of the Hindus, about 800 A D Their invention of the sign for zero greatly simplified arithmetic computation By comparison, the Roman numeral system containing no zero was awkward Try adding MXC [1000 + 100 — 10] to CIV [100 + (5 — 1)]. It's obviously much simpler to add 1,090 and 104.

Three pairs of common English rabbits were let loose in Australia, in the middle of the nineteenth century Within a decade, the six rabbits had multiplied into millions, menacing the country's agriculture

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Second most numerous of living things - second only to the insects - are mollusks (soft-bodied animals with hard shells

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The royal house of Saudi Arabia may at present have as many

as 5,000 princes and an equal number of princesses. King Abdul Aziz Ibn Saud, who ruled from 1932 until his death in 1953, had 300 wives.

If the population of the Earth were to continue to increase at the present rate indefinitely, by 3530 A D the total mass of human flesh and blood would equal the mass of the Earth By 6826 A.D , the total mass of human flesh and blood would equal the mass of the known universe.

Modern archaeologists have not yet agreed on how large a crowd the Colosseum in Rome could hold in its glory days. One authority estimates 50,000, but about 45,000 is the generally accepted figure

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Yugoslavia has two alphabets (Latin and Cyrillic), three major religions (Orthodox, Catholic, and Muslim), four cultures (Latin, German, Slavic, and Oriental), five nationalities (Serbs, Croats, Slovenes, Macedonians, Montenegrins), six republics (Serbia, Croatia, Slovenia, Macedonia, Montenegro, and Bosnia-Herzogovina), and seven neighbors (Italy, Austria, Hungary, Romania, Bulgaria, Greece, and Albania).

It may take many steps, but by adding its reverse to any integer (except perhaps one) a palindromic sum can be attained That is, the sum is the same from right to left as from left to right. Examples:

38	139	48,017
83	931	71,084
121	1070	119,101
	0701	101,911
	1771	221,012
		210,122
		431,134

From 89 to its palindromic sum 8,813,200,023,188 – takes twenty-four steps. There may be an exception to the conjecture that every integer will eventually produce a palindrome. Boris A. Kordemsky, a Russian mathematician, has noted that the number 196 has been carried by computers beyond thousands of steps without yet producing a palindrome.)

The Fibonacci series in mathematics – named for the great thirteenth-century Italian expert on numbers – is the series in which each number equals the sum of the preceding two: 1 plus 1 equals 2, 1 plus 2 equals 3, 2 plus 3 equals 5, 3 plus 5 equals 8, 5 plus 8 equals 13, 21, 34, 55, 89, 144, and so on. The Fibonacci series turns out to be of importance to botanists as well. Leaves on a branch are often placed helically around the stalk, that is, each leaf is a little higher than and to one side of the preceding one. Different plants have characteristic angles of divergence of adjacent leaves. The angle, as Boris A. Kordemsky has noted, is expressed usually by a fraction of 360 degrees. For the linden and elm, the fraction is 1/2, for the beech, 1/3, oak and cherry, 2/5, poplar and pear, 3/8, willow, 5/13, and so on. The same angle is preserved in the arrangement of each tree's branches, buds, and flowers.

In their encyclopedia, *Elements of Mathematics*, a group of French mathematicians working under the collective pseudonym of Nicholas Bourbaki spent 70 pages just introducing matters relating to the number 1.

The number of possible ways of playing just the first four moves on each side in a game of chess is 318,979,564,000.

Using cesium atoms, the clock at the National Bureau of Standards in Washington, D.C., will gain or lose only one second in 300 years.

Lord Byron's daughter, Augusta Ada Byron, Countess of

Lovelace, was an accomplished mathematician and the associate of Charles Babbage, who designed the principles of the first general-purpose digital computer. She is credited with developing the essential ideas of computer programming, which in refined form are still valid today.

Coffee is the world's second largest item of international commerce. (Petroleum is first.)

Seven percent of licensed drivers in the U.S. are sixteen- and seventeen-year-olds, and they are responsible for thirty percent of all automobile fatalities.

Americans' popular image of Europeans may be ten or twenty years out of date. Most Europeans have a greater life expectancy than Americans. Four European countries have a higher living standard than the U.S. - Sweden, Switzerland, Norway, Denmark. The gross national product of West Germany and France combined is estimated to be 18 percent larger than the GNP of the U.S.S.R. The GNP of France alone is greater than that of China, higher than the forty-one Latin American countries (including Brazil, combined.

Twenty-five million of the 162,000,000 telephones in the U.S. have unlisted numbers.

In the dozen years from 1962 to 1974, the number of dead letters handled by the U.S. Postal Service more than doubled. In 1962, the total was 22,300,000 dead letters, in 1974, there were 44,872,000. At 13 cents per letter in the fiscal year 1976, Americans wasted about $5.5 million on postage. The two major reasons for dead letters: poor or illegible address and no return address.

There are more than a hundred distinct ethnic groups in the Soviet Union.

You could build a fourteen-story building inside the choir of the medieval cathedral of Beauvais without reaching the roof which at about 157 feet is the highest of all Gothic vaults.

The Cathedral of Notre Dame in Amiens covers 8,500 square yards. When it was completed in the Middle Ages, the entire population of the city, about 10,000, could attend the same service.

In the 1970 census, the U.S. had 2,983 men who were already widowers at the age of fourteen and 263 women who – at the same age, fourteen – already had been widowed or divorced.

Take fifteen copies of *Isaac Asimov's Book of Facts* and number them '1' to '15.' If you tried to line them up in all possible arrangements, and if you made a change a minute, it would take you 2,488,996 years to do it.

A prime number is any number that can be divided only by itself and 1. There are an infinite number of primes. Any one of those primes, except for 2 and 3, will become evenly divisible by 6 if you either subtract 1 from it or add 1 to it. For example, the number 17, if 1 is added to it, is evenly divisible by 6, or the number 19, if 1 is subtracted from it, is evenly divisible by 6.

Before the computer was used in determining prime numbers, the largest known prime was $2^{127} - 1$. To test such a number on a standard calculator requires many months, and similar amounts of time are needed to check the result. In 1971, the American Mathematical Society received the highest known prime number, $2^{19937} - 1$, a number of 6,002 digits. It was calculated on an IBM computer in 39 minutes, 26.4 seconds.

Great mathematical minds have always enjoyed playing with

numbers, feeling that there is but a small step from recreational math to creative math Leibniz, for example, spent much time playing – which in his case meant studying – solitaire, and Einstein devoted considerable shelf space to books on mathematical games.

There are fifty-two cards in an ordinary deck The number of ways in which they can be arranged is just about 80,660,000,000,000

immediate acceptance. In the year 1700 their use was forbidden in European commercial dealings because they could be forged more easily than Roman numerals. (Changing 1979 seems to be simpler than changing 'MCMLXXIX'.) Arabic numerals were not completely accepted throughout Europe until 1800.

The number 2520 can be divided by 1 and 2 and 3 and 4 and 5 and 6 and 7 and 8 and 9 and 10 as well as by 12, 14, 15, 18, 20, 21, 24 ... without having a fractional leftover. 2520 is the smallest number with seventeen or more divisors.

The number 37, which cannot be wholly divided by any number except by 1 and itself, has the property that it will wholly divide the following numbers: 111, 222, 333, 444, 555, 666, 777, 888, 999.

There is a way of writing 1 by using all ten digits at once:

$$\frac{148}{296} + \frac{35}{70} = 1$$

And here are four ways of writing 100 by using the ten digits once:

$$70 + 24\frac{9}{18} + 5\frac{3}{6} = 100$$

$$50\frac{1}{2} + 49\frac{38}{76} = 100$$

$$87 + 9\frac{4}{5} + 3\frac{12}{60} = 100$$

$$80\frac{27}{54} + 19\frac{3}{6} = 100$$

There is, of course, a big difference between addition and

multiplication, between subtraction and multiplication, between addition and division, and between subtraction and division. But there are exceptions

$$\frac{13}{4} + \frac{13}{9} = \frac{13}{4} \times \frac{13}{9} = \frac{169}{36}$$

$$\frac{3}{5} - \frac{3}{8} = \frac{3}{5} \times \frac{3}{8} = \frac{9}{40}$$

$$\frac{169}{30} + \frac{13}{15} = \frac{169}{30} \div \frac{13}{15} = \frac{13}{2}$$

$$\frac{121}{28} - \frac{11}{7} = \frac{121}{28} \div \frac{11}{7} = \frac{11}{4}$$

Also, the numbers 19 and .95 give the same result whether you multiply them or deduct the second from the first: 18.05

$$10 \times 10 \text{ plus } 11 \times 11 \text{ plus } 12 \times 12 = 365$$
$$13 \times 13 \text{ plus } 14 \times 14 = 365$$

The values 10×10 through 14×14 are the only consecutive products that give identical results when arranged as above. By coincidence, the results are the number of days in a year.

The largest number that can be written with three digits is 9^{9^9}, that is $9^{387420489}$. No one knows exactly its value; it's a number that begins with 428124773 . . . It would have 369 million digits - and would take years to read.

There are at least two ways of writing '1000' with 8s only:

$$\frac{8+8}{8}(8 \times 8 \times 8) - 8 = 1000$$

$$\frac{8888 - 888}{8} = 1000$$

And here are three of several ways of writing '10' with 9s only:

$$9 + \frac{99}{99} = 10$$

$$\frac{99}{9} - \frac{9}{9} = 10$$

$$\left(9 + \frac{9}{9}\right)\frac{9}{9} = 10$$

The number 10 is used as a convenient base to count with, but the Gauls of ancient France, the Mayas of Central America, and other peoples used a base of 20. The Sumerians, the Babylonians, and others after them used a base of 60. 60 convenient because 60 can be evenly divided by 2, 3, 4, 5, 6, 10, 12, 15, 20, and 30. This 60 survives in the divisions of hours into minutes and minutes into seconds, and in the division of the circle into 360 degrees.

One of the most famous unsolved problems in mathematics is 'Fermat's last theorem,' named for the French mathematician Pierre de Fermat (1601-65). He wrote that he had found that a certain equation, $x^n + y^n = z^n$, had no solution in whole numbers, except where $n = 2$. Thus, $3^2 + 4^2 = 5^2$. Fermat went on to say that he didn't have the space in his notation for the simple proof. Mathematicians have been searching for the proof for three centuries, in vain. Modern computers have shown that the equation has no solutions for all values of n up to 2,000, but this is not the general proof we are still looking for.

The abacus was used in the West in medieval times, and then forgotten. Interest in the counting tool was revived when the abacus was brought to France by Lieutenant Jean Victor Poncelet, when he was freed by the Russians after Napoleon's fall.

Fra Luca Pacioli, in 1494, published a huge volume on mathematics that was an important summary of all that was then known on the subject. Pacioli's greatest fame came, however, from the publication of the double-entry bookkeeping system as part of that book. It earned him the title 'Father of Bookkeeping.'

The method of house numbering using odd numbers on one side of the street and even numbers on the other was instituted in the U.S.

123456787654321 is 11,111,111 multiplied by itself

There is an infinite number of numbers that have the same value whether added or multiplied. They follow this pattern:

$3 + 1\frac{1}{2} = 3 \times 1\frac{1}{2} = 4\frac{1}{2}$
$4 + 1\frac{1}{3} = 4 \times 1\frac{1}{3} = 5\frac{1}{3}$
$5 + 1\frac{1}{4} = 5 \times 1\frac{1}{4} = 6\frac{1}{4}$
. . .
$1000 + 1\ 1/999 = 1000 \times 1\ 1/999 = 1001\ 1/999$
etc.

However, there is only one integer that can be added to itself and multiplied with itself with the same result

$$2 + 2 = 4 \text{ and } 2 \times 2 = 4$$

The Gregorian calendar is the version used today. Pope Gregory XIII corrected the time error in the Julian calendar (used prior to the Gregorian) by eliminating ten days in 1582 and by ordaining that thereafter the years ending in hundreds should not be leap years unless divisible by 400. Most Roman Catholic countries accepted these changes immediately. Protestant countries delayed for a while.

By repeating the number 2 five times, you can write the value of all 10 digits:

$2 \cdot 2 - 2 - 2/2 = 1$
$2 + 2 + 2 - 2 - 2 = 2$
$2 + 2 - 2 + 2/2 = 3$
$2 \times 2 \times 2 - 2 - 2 = 4$
$2 + 2 + 2 - 2/2 = 5$
$2 + 2 + 2 + 2 - 2 = 6$
$22 \div 2 - 2 - 2 = 7$
$2 \times 2 \times 2 + 2 - 2 = 8$
$2 \times 2 \times 2 + 2/2 = 9$
$2 - 2/2 - 2/2 = 0$

The total number of different bridge hands possible is roughly 54 octillion: 54,000,000,000,000,000,000,000,000.

Because the mathematician John Wallis was an extremely nationalistic Englishman, he used his influence against the adoption by Great Britain of the Gregorian calendar. He argued that acceptance would imply subservience to Rome (and, hence, to foreigners). His views led to a delay in inevitable adoption by half a century.

In 1816, Timothy Dwight, the president of Yale, inveighed against the "alarming and terrible" divorce rate in Connecticut. At that time, about one of every hundred marriages was being legally dissolved. In 1977 alone, about 1.1 million marriages in the United States ended in divorce. In 1977 there were about 2.2 million marriages.

There are 11.5 psychiatrists per 100,000 population in the U.S. In the nation's capital, however, there are 56.1 per 100,000.

A computer program at Dartmouth College on birth-control practices has built into it a 1-in-10 billion chance that a woman will become pregnant though strictly celibate.

The atomic nucleus takes up only about one quadrillionth (1/1,000,000,000,000,000) of the room in an atom; but about 99 97 percent of all the matter in an atom is squeezed into that tiny nucleus at its center

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While modern man can expect to live out the biblical span of three score and ten years, life expectancy was never so high in the past. The following life expectancies were estimated for the average male at age fifteen, past the age of childhood diseases Neanderthal, thirty-three years; Bronze Age, forty years, ancient Greece and Rome, thirty-six years, medieval England, forty-nine years; United States at the turn of the century, sixty years Estimates were based on examination of skeletons, tombstones, legal documents, and census records Infectious disease was the most common cause of death)

The last state to join the union, Hawaii, is the state with the highest average male lifespan – 73 60 years North Dakota has the highest average female lifespan – 80 36 years The District of Columbia has the lowest male lifespan – 65 71 years – and it has the lowest for females – 75 31 years.

With all the possibilities for variation among the sex cells produced by each parent, it seems quite certain that each one of the estimated sixty billion humans who have lived has been distinctly different from every other one, and that this should continue for the indefinite future The few exceptions are identical twins, triplets, etc , for they arise from a single fertilized ovum that divides into two or more separate cells that then develop independently

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In India, 34 percent of all rural families and 44 percent of all urban families live in one-room homes In the four largest cities the figure averages 67 percent In Calcutta it is 79 percent, and it leaves uncounted the myriad who live and sleep on the pavements and in the streets

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Drilling an oil well five miles deep requires drilling night and day, seven days a week, for as long as 500 days.

In terms of the resources he will use in his lifetime and the pollution he will cause, one citizen of the U.S. is the equivalent of about eighty citizens of India.

The total population of the Earth at the time of Julius Caesar was 150 million. The total population *increase in two years* on Earth today is 150 million.

The English astronomer Edmund Halley prepared the first detailed mortality tables, in 1693. Life and death could now be studied statistically, and the life-insurance business was born.

Three years before the potato famine of 1848, the population of Ireland was 8.25 million. Three years after the famine, it was 6.5 million. About 1 million people had died, and a million had emigrated. The population of Ireland right now is only a little over half the 1848 figure.

During the next minute, 100 people will die and 240 will be born. The world's population problem increases by 140 people per minute.

The New York Public Library adds nearly a million items to its collections each year.

There are 2,500,000 rivets in the Eiffel Tower.

People who have never married are 7 times more likely to be hospitalized in a state or community psychiatric facility than those who are married. According to the National Institute of Mental Health, the rate for such admissions in 1975 for

Americans fourteen years of age and older was 685 2 per 100,000 unmarrieds, compared with 89.9 per 100,000 marrieds.

In 1978, the Center for Population Research estimated that a million teen-age girls in the U.S , or one in ten between the ages of fifteen and nineteen, become pregnant every year. About 600,000 actually bear children

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OF WIVES AND MISTRESSES

Stephen Douglas's antagonism toward Abraham Lincoln stemmed partly from the fact that Mary Todd had chosen Lincoln over Douglas as a suitor. Mary Todd met both Douglas and Lincoln at the same time and was courted by both. Her ambition led her to evaluate the two men and she chose Lincoln as the most likely to attain future success and as her own best chance for glory.

The love affair of the eighteen-year-old Héloise (1101-64) with her forty-year-old teacher Abelard (1079-1142) became so well known that it overshadows Heloise's later accomplishments. After what today would be called a graduate course in medicine, philosophy, and other disciplines, Héloise practiced and taught medicine for twenty years at the Hermitage of Paraclete near Troyes in France.

Peter the Great had his wife's lover executed and his head put into a jar of alcohol. She had to keep it in her bedroom.

When the Elector of Hanover became George I of England in 1714, his wife did not become Queen because she had committed adultery. He placed her under house arrest in Ahlden Castle, where she stayed for thirty-two years. Those who knew her fate called her the 'Prisoner of Ahlden,' and so she remains in history. Ironically, George had arrived in England with his two mistresses. Adultery was a crime only for wives.

The Babylonians auctioned off marriageable girls every year. Men had to bid high for the most attractive girls, and their money provided dowries so that the ugly girls, for whom no

one would bid, could find husbands. Herodotus considered this the wisest of Babylonian customs.

'An utter stranger takes the liberty of addressing you,' began a note from Shelley's sister-in-law, Claire Godwin, to George Byron, whom she had not met. 'It may seem a strange assertion, but it is no less true that I place my happiness in your hands . . . I know that you have the reputation of being mad, bad, and dangerous, but nevertheless you hold my destiny . . .' Byron yielded to the request for assignation. He met Miss Godwin, despised her, loved her – and shucked her

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Marie Budberg (1892-1974) was 'the center of London's intellectual, artistic, and social life' for four decades Born as a Russian aristocrat, she was fluent in five languages, published thirty books, and was a costume designer and an adviser to theater (and, later, movie and television) directors. Her amorous liaisons included Maxim Gorky (with whom she lived for many years) and H G. Wells. Her home was a salon in the tradition of the eighteenth century.

The Nayar people of South India have had an unusual kind of household A young woman marries a man whom she almost never sees Various lovers visit her, and most of her children result from these liaisons The woman and her children live with her sisters and their children Their brothers are the male authority figures in the household, although they, too, are rarely present. This life-style is less common today than it was in the past, but it still exists

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Fernande Olivier lived seven years (1904-11) with Picasso and wanted to marry him. However, she was unable to locate her estranged husband and obtain the necessary divorce. In the mid-1940s, she happened to learn that her husband had died just after she had first met Picasso in a corridor of the tenement known as the Bâteau-Lavoir – forty years earlier.

Alexandre Gustave Eiffel the builder of the Eiffel Tower in Paris, which opened in 1889, created at its peak the highest man-made love nest so that he could carry on his personal trysts The aerie is open now to all visitors

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Though popularly thought to have been an Egyptian, Cleopatra was a Macedonian, the daughter of Ptolemy XI She married two of her brothers and was the mistress of both Caesar and Mark Antony

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The British trounced George Washington's depleted army at White Plains, then at Fort Washington, then at Brandywine, then at Germantown, and could have delivered the knockout blow at Valley Forge in the ferocious winter of 1777-78 But they didn't They didn t attack because William Howe, the British general in command of George III's forces in the colonies, had found warm comfort in nearby Philadelphia with a certain Mrs Loring By spring, the Colonial army was able to wriggle off the hook

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The fourth Mogul Emperor, Jahangir, who ruled from 1605 to 1627, had a harem of 300 royal wives 5,000 more women, and 1,000 young men for alternate pleasures Outside the palace, he stabled other kinds of pets 12,000 elephants, 10,000 oxen, 2,000 camels, 3,000 deer, 4,000 dogs, 100 tame lions, 500 buffalo, and 10,000 carrier pigeons.

After his love affair of two years with Catherine the Great, Gregory Aleksandrovich Potemkin continued to be an important adviser to Catherine He even helped to choose her subsequent lovers.

The Thracians were a warrior people who lived in what is today Bulgaria, from about 1300 to 500 B C , when they were reduced to vassals by the Persians They practiced polygamy When a man died, his wives argued among themselves as to

which one had been his favorite. The wife who was finally decided upon as the favorite won the privilege of being killed and placed next to her husband in his tomb.

In ancient Greece, women counted their age from the date on which they were married, not from the day they were born, signifying that the wedding marked the start of a woman's real life.

By the end of the sixteenth century, there were about 11,600 courtesans in Venice, twelve times the number of patrician wives. The names and addresses of the courtesans were published in a book, copies of which may be seen today in the Library of St. Mark. The courtesans were the only commoners who mixed with ease with the Venetian upper class.

Sally Hemings, the black slave who is thought to have been Thomas Jefferson's mistress for twenty-five years, was a blood relative of Jefferson's wife. She was Martha Jefferson's half sister. Martha's father, John Wayles, had taken Betty Hemings, Sally's mother, as a concubine after the death of his third wife. Betty bore him six children, of whom Sally was one.

ON BOOKS

In 1800, the Congress appropriated $5,000 'for the purchase of such books as may be necessary for the use of Congress at the said city of Washington, and for fitting up a suitable apartment for containing them.' Currently, the Library of Congress houses over 72 million pieces of research material including over 16½ million books and 61 million manuscripts, and costs over $360 million a year to run.

Long before Europeans 'invented' movable type of metal in the fifteenth century, the Tibetans, Chinese, and Koreans were using various other kinds of movable type. The Chinese were motivated primarily by the desire to make Confucian texts more readily available. Later, between 1403 and 1484, the Korean court undertook eight large-scale printing projects with movable type.

Columbus had with him on his first voyage to the New World a copy of Marco Polo's book about his thirteen-century, twenty-two-year odyssey to China and back.

A factor in keeping Persian the language of modern Iran and preventing replacement by Arabic was the writing of the Book of Kings, in Persian, by the eleventh-century poet Firdausi – a poem of 60,000 verses, seven times the length of Homer's *Iliad*, detailing the history of the Persian kings from legendary beginnings down to Khosru II in the seventh century. It has remained the great national poem of the nation and its preeminent literary work.

For some languages, translations of the Bible are the first

works, or even the only works, in their literature. The only notable work in Gothic, for instance, is the translation of the Bible by Ulfilas, who was converted to Christianity at Constantinople and in 341 A D consecrated a bishop It is said that Ulfilas even had to invent the alphabet he used.

There was a time – the twelfth century – when the most important scientific work was translation The books of the Arabic scholars, who for centuries had preserved the words of the Greek philosophers by translation and commentary, began to be rendered into Latin

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Chapbooks, the comic books of their time, were named after the chapmen, or peddlers, who sold them They were cheap in price and crudely illustrated In 1682, one of the most popular American chapbooks was *Mary Rowlandson's Captivity*, an account of a woman captured by the Indians It sold 5 million copies Chapbooks achieved their greatest popularity in the early nineteenth century, but had disappeared by the advent of the U.S. Civil War.

The *Communist Manifesto* of Marx and Engels was ignored in Germany when it was published in 1848, and a Russian translation was suppressed by censors in the 1860s It remained a rare pamphlet until it was reprinted in 1872.

Twice as many books on religion were published in England as works of fiction in 1870 Sixteen years later, novels far outnumbered religious works

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The first children's book published in the U S was written by Puritan preacher John Cotton and printed in Cambridge, Massachusetts, in 1646 Its title was *Spiritual Milk for Boston Babes in Either England Drawn from the Breasts of Both Testaments for Their Souls' Nourishment*

Some fifty volumes of the writings of Aristotle have survived mainly by a fortunate chance. About 86 BC the men of a Roman army invading Asia Minor found a number of manuscripts of Aristotle's works in a pit and brought them to their general, Sulla. It turned out that no other copies of them existed and Sulla had them taken to Rome and recopied.

The world's first and 'most comprehensive' encyclopedia was three volumes: the *Nuremberg Chronicle*, published in 1493. Its sole author was Hartmann Schedel, a Nuremberg physician who had a passion for collecting books and copying manuscripts. His personal library, in fact, was his chief reference source in compiling the *Chronicle*. Though published late in 1493, it did not contain the most momentous news of the preceding year, Columbus's historic voyage.

The art of printing from wooden blocks with the characters in reverse was initiated in Buddhist monasteries in China. The oldest surviving printed book that can be reliably dated is a Buddhist text, the *Diamond Sutra*, made in China in 868 AD.

By the fifteenth century, manuscript copyists had set up mass-production workshops capable of turning out sizable quantities of books. An order in the year 1437, found recently at Leyde, the Netherlands, called for 200 copies of the *Psalms of Penitence*, 200 of Cato's *Distichs* in Flemish, and 400 of a small prayer book.

The first European printers were Germans, all from one or more workshops in the cathedral city of Mainz, where the first presses appeared about 1445. By 1480, printing shops had been set up in 110 European towns. By the end of the fifteenth century, fifty years after the first book was printed, at least 35,000 editions had been published and from 15 million to 20 million books printed. This was at a time when

the total population of Europe, after pandemic plagues, was less than 100 million.)

Five hundred years ago, books were so scarce and valuable that the bishop of Winchester, England, whose entire library consisted of seventeen books, had to give a heavy bond, drawn with solemnity, that he would return, uninjured, a Bible from the convent of St Swithin

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Clement Clarke Moore (1779-1863) – a biblical scholar, professor of Oriental and Greek literature, and compiler of a Greek and Hebrew lexicon – wrote the exquisitely simple and easily remembered 'Visit from St. Nicholas'. ''Twas the night before Christmas and all through the house . '

The best seller of all American books? The *Guinness Book of World Records*? Dr Spocks's *Common Sense Book of Baby and Child Care*? *The World Almanac & Book of Facts*? None of them comes anywhere near Noah Webster's *Blue-Backed Speller* published in 1783. In revised editions, it is still in print and has sold well over 100 million copies. (Watch out for *Isaac Asimov's Book of Facts*.)

Euclid is the most successful textbook writer of all time. His *Elements* – of around 300 B C. – has gone through more than 1,000 editions since the invention of printing The phrase 'I studied my Euclid' was for a long time synonymous with 'I studied geometry.'

The first known English book in which the 'New World' is mentioned was published in 1509 It was Alexander Barclay's translation of a long didactic poem by the German satirist Sebastian Brant, *Das Narrenschiff*. In English it is *The Shyp of Folys* ('The Ship of Fools').

An important step in the history of reference works was made when the German physician and philosopher Johann George Krunitz (1728-96) wrote his *Oekonomisch technologische Encyklopädie*. He wrote it all by himself - 242 highly organized volumes. He also wrote 438 other books.

The idea for a 'nothing book' is not new. When Hermann Boerhaave, a Dutch physician and chemist best known for his *Elementa chemiae*, died in 1738, he left behind a sealed book with the title *The Oldest and Deepest Secrets of the Medical Art*. The book, still sealed, was auctioned for $20,000 in gold. When the new owner broke the seal, he found that 99 of the 100 pages were blank. Only the title page bore this handwritten note by the 'author': 'Keep your head cool, your feet warm, and you'll make the best doctor poor.'

The first French translation of Newton's *Principia Mathematica* was done by Gabrielle du Chatelet (1706-49), who was Voltaire's mistress at the time. She also acquainted France with the ideas of Leibniz by writing, in 1740, *Les Institutions de Physique*.

General Lew Wallace's best seller *Ben-Hur*, published in 1880, was the first work of fiction to be blessed by a pope.

There are only forty-eight Gutenberg Bibles extant. This figure includes two that were in Germany during World War II; they are missing but presumed by bibliophiles to be safe.

π, the ratio of the circumference of a circle to its diameter, was computer-calculated to a million decimal places in 1973 by the French mathematicians Jean Guilloud and Martine Bouyer. The value was published as a 400-page book – very important, and yet surely one of the most boring books in the world.

Japan's favorite English-language author in the late 1970s was Thomas Hardy, whose nineteenth-century novels, like *Jude the Obscure*, are generally gloomy and naturalistic studies of character and environment.

The first printed editions of the Pentateuch, the first five books of the Old Testament, and the Talmud, the vast compilation of the Oral Law of the Jews, were published in the early sixteenth century by Daniel Bomberg's printing house in the Venetian ghetto, located near San Girolamo. Since then, many important Hebrew texts have been first published in Venice.

America's first best-selling novelist was a woman, Susanna Haswell Rowson. Although it was a melodramatic work with wooden characters and a hackneyed plot, *Charlotte Temple*, published in 1791, appealed to popular tastes. It went through more than 200 editions.

Three of the most influential books ever published came out in Europe in the very same year 1543. They were Nicholas Copernicus's *The Revolutions of the Heavenly Orbs*, Archimedes' mathematics and physics in English translation from the original Greek, and Andreas Vesalius's anatomical drawings, *De humani corporis fabrica*.

Prior to World War I, fewer than 20 books a year that were published in England dealt with military science. In Germany, almost 700 books a year were being published on the subject.

The art of printing was born at its zenith, for the first printed book, the Gutenberg Bible, is considered by many the most beautiful ever produced. Three hundred copies were printed, nearly 1,300 pages each, forty-two lines in Latin to the page.

The Gutenberg Bibles remain among the most valuable books in the world.

It is hard to imagine that an author whose novels have sold over 70 million hardcover copies in twenty-two languages was virtually unknown in America until 1977. He is Karl May, a German writer who lived from 1842 to 1912 and whose spellbinding and inspirational adventure stories are finally appearing in the U.S., after enjoying an ever-increasing popularity around the world. They were accompanied by earlier quotes from Herman Hesse, Albert Einstein, Thomas Mann, Albert Schweitzer, and many other notables in whose lives Karl May seemed to have played an essential role. Most of Karl May's novels are written in the first person singular – a fictional superhero, who one of May's U.S. editors says is 'Jesus Christ and James Bond in one person.'

Theodore Roosevelt, twenty-sixth President of the United States (1901-09) wrote forty books. His first was written during his senior year at Harvard University – *The Naval War of 1812*. Roosevelt had a long and varied career. He headed the New York City Police Board and was a Spanish-American War hero, governor of New York State, big-game hunter, explorer, and conservationist.

Pliny the Elder (23-79 A.D.) was a busy man. He wrote not only a thirty-one-volume general history of Rome and a twenty-volume history of Roman warfare, but also a thirty-seven-volume natural encyclopedia, an eight-volume Latin grammar, and a six-volume manual of oratory. In addition, he was, at various times, a general and admiral, and a governor of the Roman provinces in Africa, Spain, Germany, and Gaul.

A Gutenberg Bible was purchased at auction in 1898 for $15,000 and given to the General Theological Seminary in New York City. It was locked in a vault until 1978, when it

was sold at another auction for $2 million. (The highest price ever paid for a Gutenberg Bible was $2.5 million, in 1970.)

In another two decades, many of the books published between 1900 and 1940 will be useless. They are self-destructing, principally because of the acid in the paper and the pollutants in the air. Books made before the turn of the century were principally of rag content, and are holding up well. Since 1900, the shift in book production has been to paper of wood content.

Charles Darwin believed that the proposed first printing of his book *The Origin of Species* would be too large. 1,250 copies. But the edition was sold out the very first day of publication.

Book sales second only to *Uncle Tom's Cabin* in the middle 1800s were those of Timothy Shay Arthur's *Ten Nights in a Barroom*. The former was an immediate best-seller and, according to President Lincoln, the spark that fired the Civil War. About 100,000 copies of Arthur's temperance work had been bought by 1880. Both books were dramatized.

There are up to 11 million index cards, between the first card for 'A' (pseudonym of English writer Matthew Arnold) and the last card for 'Zyve, Claire Turner' (editor of radio plays in the 1930s), in the 9,000 separate drawers, or trays, that make up the main catalog of the Research Libraries of the New York Public Library. Nearly 900 trays are needed to hold the 'S' cards, even 'X' fills the equivalent of two whole trays.

Perhaps the world's most prolific playwright was Lope de Vega (1562-1635). He may have written as many as 2,200 plays, of which fewer than 500 survive.

The first collection of Aesop's animal fables was put together 200 years after his death, and included many that originated long after the Greek slave from Africa had departed this vale of tears.

Freud's major work by general consensus was *The Interpretation of Dreams* (1899) for which he was paid $200. Freud himself said of it: "In light such as this falls to one's lot but once in a lifetime." Nevertheless, eight years were to pass before the entire first printing – 600 copies – had been sold. The work has been reprinted many times in many countries. At least three publishers in the United States, one paperback and two hardcover, are selling it today.

Kepler's story *Somnium*, published after his death in 1630, is the first piece of authentic science fiction, as opposed to fantasy, because it was the first to try to describe the lunar surface as it really was.

Goethe's book *Farbenlehre*, or History of the Theory of Colors, brilliantly but mistakenly argued the case for white light being pure and unmixed. It is now remembered only as the last dying wail against the optical revolution initiated by Newton, who had discovered that sunlight, and white light in general, could be split up by a prism into a rainbow of colors. White light is actually a mixture of colored lights.

The first person to labor over the right angles of a particular quadrilateral, in connection with Euclid's fifth postulate, was Omar Khayyám. Omar should be remembered as a great mathematician and astronomer, but his clever quatrains made him more famous as a hedonistic and agnostic poet.

An Hungarian mathematician, Farkas Bolyai, published a textbook on mathematics in 1831. He included a twenty six

page appendix written by his twenty-year-old son, Janos. This appendix proved to be one of the foundations of non-Euclidean geometry, it was a mathematical landmark worth far more than anything else in the book

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When Charles Darwin published his pioneer work on human evolution, *The Descent of Man*, in 1871, not a single fossil that was known to be pre-human had been found to support his ideas Although his theory was later proved to be true, it was formulated entirely without physical evidence and was based almost completely on speculation

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Between 1924 and 1932, nearly one hundred British intellectuals wrote a book apiece speculating on the future Not one book was about the possibility of overpopulation (The celebrated geneticist J B S. Haldane (1892-1964) predicted the U S population would level off at 145 million.)

In looking at 200 fairy tales by the Brothers Grimm, a rough scoring of the male and female characters reveals a strong dichotomy. There are sixteen wicked mothers or stepmothers and only three wicked fathers or stepfathers There are twenty-three evil female witches and only two evil male witches There are thirteen young women who kill or endanger the men who love them, but only one man who harms his bride.

It wasn't until 1609, sixty-six years after the book was published, that it was discovered, by Kepler, that a Lutheran minister had added an unauthorized preface to Copernicus's classic The preface said, in effect, that the Copernican theory was not being advanced as a description of the actual facts but only as a device to facilitate computation of planetary tables This weakened the book and compromised the reputation of the dead Copernicus For thirteen years, Copernicus had hesitated to publish his theories, believing that any

suggestion that the Earth moved would be considered heretical and might get him into trouble (as, later, Bruno and Galileo got into trouble). Playing it extraordinarily safe, Copernicus carefully dedicated the work to Pope Paul III, but it was not removed until 1835 from the *Index Librorum Prohibitorum*, the list of books officially banned by the Church.

Descartes's hundred page appendix to a book on vortexes and the structure of the solar system proved to be next month more important than the book itself. Descartes's appendix combined algebra and geometry, to the great enrichment of both, in explaining that through the use of his coordinate system every point in a plane could be represented by an ordered system of two numbers and every point in space by an ordered system of three numbers.

To get her cookbook published in 1896, Fannie Farmer had to pay Little, Brown and Company the printing costs of the first 3,000 copies. The publisher refused to take the risk, saying that women would not buy such another collection of recipes. Ironically, her *Boston Cooking School Cook Book* eventually became the most popular cookbook of its time and a 'gold mine' through the years for the publisher, millions of copies having been sold in dozens of editions.

The 'Athens of the West' – the Moorish capital of Cordoba, in Andalusia, Spain's southernmost region – had in the year 900 A.D. a library of 400,000 books, miles of paved streets, and a population of half a million. To the north, Paris was a bastioned island and London, a stockade built in defense of Viking raiders.

Icelanders read more books per capita than any other people in the world.

There are more than 21 million pages of manuscripts and other documents in the Franklin D. Roosevelt Library, at Hyde Park, New York, the first of the six presidential libraries and museums now open to the public. The others are the Herbert Hoover Library, West Branch, Iowa, the Harry S Truman Library, Independence, Missouri, the Dwight D. Eisenhower Library, Abilene, Kansas, the Lyndon B Johnson Library, Austin, Texas; and the John F. Kennedy Library, Boston, Massachusetts.

In 1444, Cosimo de' Medici founded the Medici Library in Florence, the first public library in Europe since Roman times. In collecting manuscripts and commissioning new illuminated editions of classic texts, the Medicis spent $15 million between 1434 and 1469. This library, and its 10,000 Greek and Latin manuscripts, played an important role in spreading Italian humanism.

Copies of all the millions of books (over 16.5 million) in the Library of Congress could be reduced page by page to photochromatic microimages and the lot could be stored in six four-drawer filing cabinets.

Johann Gutenberg created the world's most famous book – the first printed book, the Gutenberg Bible – but he didn't get to publish it. He had gone into debt to produce the Bible, and was sued for the money. He lost the suit, and was forced to hand over to others his tools and presses, plus the distinction of being the publisher of what is considered by many to be the world's most beautiful book.

In his diary entry of August 2, 1882, Lewis Caroll (author and publisher) estimated that even if he sold the entire 2,000-copy first printing of *Alice in Wonderland* he would lose £200. By selling another 2,000 copies, he would make £200. If he sold additional copies, he would then realize a bigger gain, but

'that I can hardly hope for.' Before his death, in 1898, about 180,000 copies had been sold.

Diderot's twenty-eight volume *Encyclopedia*, which included among its contributors the greatest names of the Age of Reason, Rousseau and Voltaire, and exemplified the Age of Enlightenment, began as an assignment to Diderot by a consortium of Parisian publishers to translate a single-volume British encyclopedia into French. Diderot's work took twenty-five years, was suppressed by the state council, and condemned by the Church, yet was quoted by the courts to settle arguments – and elsewhere to stir a revolution. It became the model for all future encyclopedias.

Printed books of religious songs were being produced as early as 1476, but at that time each publication had to be run through the press three times: once for the staff lines, once for the note heads and stems, and once for the words. It wasn't until 1525 that a printer worked out a way of printing everything at once.

The vast collections of The Research Libraries of the New York Public Library – many millions of books, pamphlets, magazines, and other items – are arranged in the stacks not by author, not by title, not even by subject, but by height. This is done to save space, and is possible only because the stacks are closed to the public, which removes the necessity of having related items physically together.

In 1814, when George Byron's poem 'The Corsair' was published, 30,000 copies were sold in a single day.

Emperor Justinian bribed two Persian monks who had lived in China to return there and bring back silkworm eggs by secreting them in hollow bamboo canes. Thus, Constantinople was able to begin silk production, about 550 A D From those worms were descended all the silk-producing caterpillars in Europe down to modern times

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So they could be picked out quickly, slaves under the last emperors of China (the Manchus, 1644-1912) wore pigtails.

Among the important devices in naval technology developed by the Chinese are: the stern-post rudder, which appears on a pottery model of a boat dating from the first century A D , watertight compartments, and the paddle wheel, descriptions of which date from the fifth century A.D.

The Great Wall of China - 2,500 miles long, stretching over more than one-twentieth of the Earth's circumference - was the longest continuous construction project in history. It was built over a period of 1,700 years, enough stone was used to build an eight-foot wall girdling the globe at the equator

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Marco Polo first thought Kublai Khan possessed the secret of the alchemists 'because he has the art of producing money ' China was using paper money, a medium that hadn't been heard of in Polo's Europe.

Believers in Jainism, a religion practiced in India by about 2 million people, do not believe in killing any living thing, not even an ant. Orthodox Jains do not ride in automobiles, for

the tires may kill, and they do not wear shoes, for shoes will kill insects more surely than if one walks barefooted

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Japan did not send an ambassador to another nation until it sent Numi Masaoki to the U S for a few weeks in 1860

Kublai Khan, grandson of Genghis Khan, and ruling as head of the various Mongol princes over an immense empire, was polite enough to ask Marco Polo's father, Nicolo, and uncle, Maffeo, to send missionaries to teach him and his people Christianity But the Polos, on their return to Europe, found the papacy in the turmoil of an interregnum, and no missionaries were sent.

The Chinese city of Chinkiang, now 150 miles inland, was once a seaport Silt of the Yangtze River has built up the land for that distance.

Until 1834, Canton was the only Chinese port allowing any access to foreigners – men only The Chinese temporarily cut off all trade with Americans when a girl, from Salem, Massachusetts, disguised herself as a boy and sneaked into the trading offices – only to be found out

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A European served as mayor of a Chinese city in the thirteenth century Marco Polo gained the confidence of Emperor Kublai Khan and was appointed head of the Yangchau administration. He ran the city for three years

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There were geomancers, literally 'earth diviners,' in ancient China They would place on a magnetic stone a metal disc that was inscribed with astronomy and water signs, and from its orientation they would read the 'lines of force' stretching across the landscape Some of the most beautiful Chinese villages and towns were designed by geomancers, who set

houses in places needed to concentrate energy or to disperse it.

Astrologers in China, during Marco Polo's visit (1271-95), would tell relatives how the dead person must be taken from the house to ward off bad luck. It wasn't always through the door. The family sometimes would have to break through a wall.

Because the Japanese word for 'four' sound exactly like the word for 'death' and because the word for 'nine' sounds like the word for 'suffering,' there are no rooms numbered 4 or 9 in many hospitals and hotels in Japan

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'Memory color' means that man tends to see the familiar things as having the same colour under a variety of lighting conditions. The owner of a blue automobile is likely to see it as blue in dim light, in bright light, under a yellow streetlamp or in the glow of a red sunset. Someone not familiar with the car would have difficulty under the same conditions in deciding what the 'true' color is. Memory color doesn't always work. When a steak is seen under a blue light, the meat looks putrid regardless of how many steaks the viewer has seen or eaten.

Each square inch of human skin consists of 19 million cells, sixty hairs, ninety oil glands, nineteen feet of blood vessels, 625 sweat glands, and 19,000 sensory cells.

The soft mass of the adult brain is motionless. Though it consumes up to 25 percent of the blood's oxygen supply, it does not grow, divide, or contract.

The pupils of your eyes can give clues to your emotions if the other person can see them. If you are trying to bargain for something you want very much, wear dark glasses, for your pupils may dilate when you show interest and you may end up paying a higher price for the merchandise.

Human reproduction follows lunar time rather than sidereal, or solar, time. Gestation is about 266 days – nine lunar months – and the menstrual period is one lunar month.

Man has tiny bones once meant for a tail and unworkable muscles once meant to move his ears.

Nerve signals may travel through nerve or muscle fibers at speeds as high as 200 miles per hour.

Every person has nearly 400,000 radioactive atoms disintegrating into other atoms in his or her body each second. But there's no need to worry about falling apart. Each body cell contains an average of 90 trillion atoms – 225 million times that 400,000.

Man's three-pound brain is the most complex and orderly arrangement of matter known in the universe

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To keep your feet warm put on a hat. Eighty percent of all body heat escapes through the head.

People who live in the high altitudes of the Andes have developed oversized lungs in an extra-large chest in order to live easier with the low air pressure. (In the Andes air pressure is only eight pounds per square inch, at sea level, it is fifteen pounds per square inch.) In addition, their bodies have changed to help meet the problem of cold. Shorter-than-normal arms and legs, the result of countless generations of adaptation, mean that blood needs to circulate shorter distances

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Most people by the age of sixty have lost 50 percent of their taste buds and 40 percent of their ability to smell.

The largest cell in the human body is the female ovum, or egg cell. It is about 1/180 inch in diameter. The smallest cell in the human body is the male sperm. It takes about 175,000 sperm cells to weigh as much as a single egg cell

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The scientist Paul Weiss has estimated that each of us has in his brain about as many cells as there have been seconds in time since our part of the cosmos began to assume its present form

about 1 quadrillion (1,000,000,000,000,000) . Further, he estimates that each one has about 10,000 molecules and receives about 1,000 connections from other brain cells as the macromolecules of each develop linkages with . He computes that the brain uses 1,000 cells per second, seemingly at random, which means a of billion new linkages daily. Yet, amazingly, basic patterns and memories are maintained.

The sensitivity of the human eye is such that on a clear, moonless night a person standing on a mountain peak can see a match being struck as far as 50 miles away. Much to their amazement, astronauts in orbit around the Earth were able to see the wakes of ships.

The lens of the human eye is composed of numerous transparent fibres and is encased in a clear elastic membrane. New fibres are constantly being created. Therefore the size of the lens increases with age. The lens of an eighty-year old is more than 50 percent larger than that of a twenty-year old. However, as the lens grows larger, it becomes less pliable and its ability to focus for near vision is reduced.

The human body consists of about 60 trillion cells and each cell has about 10,000 times as many molecules as the Milky Way has stars.

It is a comparatively recent insight that light travels from the object to the eye. Until about 400 years ago, it was thought that there was 'something' in the eye that went out and saw the object.

Men not only have more blood than women (1.5 gallons versus .875 gallons, on the average) - which you would expect, because men are bigger - but their blood is richer in red cells. Each cubic centimeter of blood in men contains from 4.6

million to 6.2 million red blood cells, compared with 4.2 million to 5.4 million for women.

The brain is surrounded by a membrane containing veins and arteries. This membrane is filled with nerves of feeling. However, the brain itself has no feeling, if it is cut into, the person feels no pain.

The only part of the human body that has no blood supply is the cornea. It takes oxygen directly from the air.

The heart beats faster during a brisk walk or heated argument than during sexual intercourse.

We think we cannot see at night. But given enough time to adjust, the human eye can, for a time, see almost as well as an owl's. Ultimately, as the amount of light decreases, an owl detects shapes after a human no longer can.

Arteries got their name (literally 'windpipe') when the Greek physician Praxagoras thought they carried air. In corpses they are usually empty.

Scientists estimate that they could fill a 1,000-volume encyclopedia with the coded instructions in the DNA of a single human cell if the instructions could be translated into English.

Indians who live high in the Andes Mountains have about 20 percent more blood than inhabitants of lower areas. Their extra blood consists primarily of red corpuscles, which carry the hemoglobin needed to absorb oxygen. The extra oxygen is necessary to survive in the thinner air at great heights. Hemoglobin is increased almost 60 percent by weight at 15,000 feet. The red blood cells are larger than the cells of

lowland inhabitants, allowing a greater surface for absorbing oxygen.

Thirty-five percent of all Americans, including children, are overweight. Twenty percent are at least 20 percent over the preferred weight and are counted as obese.

The Fallopian tubes are named for the sixteenth-century Italian anatomist Gabriel Fallopius, who described them but did not learn their function in human fertilization. Their function was not learned for another three centuries – until the mammalian ova, or egg cells, were discovered.

William Harvey (1578–1657) was ridiculed for his theory that blood did not oscillate back and forth in the vessels of the body, as the Greek physician Galen had believed. It moved in one direction, in a closed curve – it circulated. Harvey was called Circulator, which was a cruel pun, for it was the Latin slang for 'quack,' the name given to peddlers who hawked medicines at the circus. In Harvey's old age, the fact of circulation became generally accepted by physicians, his theory marked the beginning of modern physiology.

If 80 percent of your liver were to be removed, the remaining part would continue to function, and within a few months the liver would have reconstituted itself to its original size.

At sea level there are 2,000 pounds of air pressure on each square foot of your body area.

Seven of the twelve major nerves in the head – the cranial nerves – were found by the Greek physician Galen in the second century A.D. For 1,400 years after Galen, physiological research and neurological knowledge remained more or less static.

Sixty thousands miles of vessels carry blood to every part of the adult body.

The skin of the human adult body weighs six pounds.

In this era of rampant worldwide inflation, the most inflationary item may well be the price of a human skeleton. According to a Reuters report, a well-preserved skeleton went for $190 in 1976, in 1978, it was selling for $475. Nowadays, a hand or a foot brings $26, a dental skull, teeth intact, can run to $140, up from $85 in 1975. But the worth of a *homo sapiens* skeleton cannot compare with that of a gorilla – $5,700 in the 1979 market!

The hydrochloric acid of the human digestive process is so strong a corrosive that it easily can eat its way through a cotton handkerchief, and even through the iron of an automobile body. Yet, it does not endanger the walls of the stomach, which are protected by a film of sticky mucus.

Among his many achievements, the astronomer Johannes Kepler chalked up one about man's inner world. It was Kepler who realized that man's visual apparatus is so constructed that it can produce only inverted images.

Because regular movements of electric current take place in the heart and in the brain, there are paper-thin, tiny fields of magnetism around the torso and around the cranium of every human being. But man does not possess, as far as is known, an organ that can (as electric fish can) exert force at a distance.

A group of ductless glands buried in the pancreas, which is an ordinary ducted gland, produces a hormone that controls the manner in which the body handles its sugar supply. Because the hormone was produced by little clumps of cells, or 'islands,' scattered through the gland, the name 'insulin'

from the Latin *insula* ('island') came into being. The islands are called the islands of Langerhans, after their discoverer, the German pathologist Paul Langerhans.

Scientists estimate that there are 3 million to 4 million genes in each human cell, and yet they have been able to identify one particular gene among those millions, produce an image of that gene, examine it for abnormalities, and determine whether the human being to whom it belongs is missing certain parts of his genetic blueprint. This can even be done long before an individual is born, in a process called amniocentesis, in which cells are taken from the fluid around the fetus and their chromosomes examined to see whether the fetus has an extra chromosome, or missing or rearranged chromosomes. Such chromosome problems would indicate mongolism, mosaicism, Tay-Sachs disease, neural tube defects, or other genetic diseases that would make it advisable to abort the fetus.)

The kidney consists of over 1 million little tubes, and the total length of the tubes in both kidneys runs to about forty miles.

The daughters of a mother who is color blind and a father who has normal vision will have normal vision. The sons will be colorblind, however.

A young French Canadian, Alexis St. Martin, was accidentally shot in the side by a shotgun blast on June 6, 1822, in northern Michigan. A doctor, William Beaumont, who happened to be present, treated him successfully, and St. Martin recovered. He retained an opening nearly an inch across that led directly into his stomach. Beaumont used St. Martin as an experimental subject, studying the behavior of the stomach and its digestive secretions under all sorts of conditions. Beaumont was able to do important pioneer work on digestion, but kept St. Martin so busy that the poor man

ran away. Despite the hole in his stomach, St. Martin lived until 1880, to an age of eighty-two, outliving the doctor by twenty-seven years. (William Osler, then dean of American medicine, unsuccessfully tried to buy St. Martin's stomach as an exhibit for the Army Medical Museum in Washington.)

Earth's magnetic field has been weakening. It seems to have lost 15 percent of its strength since 1[illegible]. At the present rate of decrease it will reach zero in 2,000 more years. Between the years 3500 and 4500, the magnetic field will not be sufficiently strong to ward off charged radiation from outer space.

The largest desert in the world – the Sahara, the very word, in Arabic, for desert – is as large in area as the U.S. The Sahara wasn't always a sahara. Twenty thousand years ago glaciers covered much of Europe and cool winds brought moisture to northern Africa. What is now desert was then a pleasant land with rivers and lakes, forests and grasslands.

The driest place on Earth is Calama, in the Atacama Desert in Chile. Not a drop of rain has been seen there.

The fact that the Earth rotates wasn't clearly demonstrated until 1851, when Jean Bernard Leon Foucault set up an experiment in which a pendulum *seemed* to change its plane of swing slowly. Actually, the pendulum continued to vibrate in a single plane, the Earth carrying the observer was slowly rotating beneath it.

The lowest point that a person can get on this planet, unless he descends in a submarine device or a mine shaft, is where the Jordan River enters the Dead Sea – 1,290 feet below sea level.

Nearly 94 percent of the volume of the Earth's crust is taken up by oxygen. The 'solid' earth is a well packed set of oxygen anions (negatively charged ions), crowded closely together, with the small cations (positively charged ions) of the other seven elements tucked here and there in the interstices. Even the Rock of Gibraltar is a heap of oxygen and little more.

Erosion of the Earth by river, marine, and ice action in Eurasia, Africa, the Americas, and Australia has been calculated at 350 tons per square mile per year. This corresponds to lowering the surface of the land forty inches every 22,000 years. At this rate (if we ignored other processes acting to raise the surface), all land mass would be worn to sea level in less than 20 million years, which is a very short period in geological terms.

Grains of sand are rounded by the action of the wind, which causes abrasion by blowing the sand particles against each other and surrounding obstacles. Once a grain reaches an almost perfectly spherical shape, it may keep that shape without further wear for millions of years.

To provide a modern person with the necessities – and luxuries – of his or her accustomed life, at least twenty tons of raw materials must be dug from the earth every *year*.

Cape Horn is not the southernmost tip of the South American continent. Cape Horn (in Spanish, *Cabo de Hornos*) is merely the southern tip of the island Hornos in the Tierra del Fuego Archipelago. The South American continent ends almost 150 miles farther north, at Puerte Bulnes on the Brunswick Peninsula.

An acre of typical farm soil (to a depth of six inches) has a ton of fungi, several tons of bacteria, 200 pounds of protozoa

(one-celled animals), 100 pounds of algae, and 100 pounds of yeasts.

Immanuel Kant suggested in the eighteenth century that tidal friction slowed the rotation of the Earth. He was correct, but it could not be demonstrated for another century. As the tidal bulge travels about the planet, it scrapes against shallow sea bottoms – especially the Bering Sea and the Irish Sea – and the energy of the Earth's rotation is dissipated in frictional heat enough to slow rotation and lengthen the day by one second every 100,000 years. Over millions of years, the day has, perforce, lengthened a total of many hours.

If you measure a mountain from its base, the tallest is not Mount Everest. It is the island of Hawaii, which is all mountain. Hawaii's topmost peak, Mauna Kea, is 13,784 feet above sea level, but it rises from a sea bottom that is 18,000 feet below sea level. From base to peak, its height is over 31,000 feet. Mount Everest's peak is 29,000 feet above sea level, but it rises only 17,000 feet from a plateau that is itself 12,000 feet high.

A force equal to that of a thirty-four megaton atomic bomb struck northern Arizona when a meteorite impacted there about 27,000 years ago. It carved out the Great Barringer Meteor Crater.

Nature's most pervasive force – gravity – is also, paradoxically, its weakest.

Almost every bit of helium that exists in the world is a product of natural-gas wells in the United States. (A gas produced by one such well in Arizona is 8 percent helium.)

The Swiss-American naturalist Jean Louis Rodolphe Agassiz

(1807-1873), who revealed an ice age to the world, has had named in his honor a lake that doesn't exist at present. Lake Agassiz had long ago covered North Dakota, Minnesota, and Manitoba – and Agassiz was able to trace it out.

Though the change in direction of Earth's rotation has advanced the December solstice to Sagittarius, the Tropic of Capricorn is used to describe the geographic latitude where the sun appears overhead because two millenia ago the December solstice was located in Capricornus and the reference has stuck. The same is true of the Tropic of Cancer, for the summer solstice is now in Gemini, not in Cancer.

One reason there is life on Earth, or that there could be life anywhere in the universe, is that the distant galaxies are moving away from us. As a result of this movement, the light that reaches us is reddened (through the Doppler effect, and loses energy and heat. In a static or a contracting universe, there would eventually be high temperatures everywhere, probably in the millions of degrees, and life could not exist certainly not life as we know it.

Life on the Earth probably developed in an oxygen-free atmosphere. Even today, there are microorganisms that can live only in the absence of oxygen.

Because the air at the end of the day is generally dustier than it is at the beginning of the day, the setting sun is redder than the rising sun.

Frigid, unattractive Patagonia, the narrowing southern tip of South America, is the only populated continental land area south of 40° South Latitude. By comparison, most of Europe, Asia, and two-thirds of North America are north of 40° North Latitude.

An island 100 miles across with an area of over 15,000 square miles sits smack in the mouth of the Amazon River. The island, Marajó, lies right on the equator and hardly anyone lives there. Its area is one third that of New York State.

The surface of the Sahara is strewn in places with milling and grinding stones from the new Stone Age. Biologists and other scientists believe the stones were used to grind wild grainlike grasses that once grew there.

Nauru, an eight-square-mile atoll midway between Australia and Hawaii, is an independent nation with a population of less than 9,000 and the highest per-capita wealth in the world. This wealth is based on annual production of 2 million tons of phosphates on which the economies of Australia and New Zealand are heavily dependent. Discovery that a fossilized rock from Nauru was being used as a doorstop in Sydney, Australia, and was rich in high-grade phosphates led to the mining of the atoll. The phosphates evolved from eons old deposits of either decayed marine organisms or bird guano.

To go on the lunar day, merely adjust your watch to lose two minutes and five seconds every hour.

The last high mountain to have been conquered is the thirteenth-highest mountain. Gosainthan, near Mount Everest, is 4.98 miles (26,291 feet) tall, and finally was climbed, by Chinese, in 1964.

Berlin and Warsaw are farther north than parts of Alaska. The southernmost Aleutian island, Amchitka is at a latitude of about 51.7 North, which is about the latitude of London, which is farther south than Berlin or Warsaw.

The Soviet Union is so wide that it encompasses eleven time zones.

Chemists know of 105 different types of atoms. Half a dozen types make up 98 percent of the whole Earth, they are iron, oxygen, magnesium, silicon, sulfur, and nickel.

The oldest rocks on Earth were discovered by Vic McGregor, of New Zealand, in 1966 and 1967. Working in Greenland, McGregor found rocks that were determined by atomic-dating to be 3.7 billion to 3.9 billion years old.

Mount Everest is a foot higher today than it was a century ago, and it may be growing at an accelerating rate.

The Soviet Union and the United States are just two miles apart. In the Bering Strait, which lies between Siberia and Alaska, there is an island named Little Diomede, which is part of the United States. Two miles to the west is another island, Big Diomede, which is part of the Soviet Union.

North America was called Turtle Island – the emergent shell, shedding water as the land rose from the sea – by the Delaware Indians.

The north face of Switzerland's Eiger, 'the meanest mountain on Earth,' claimed nine victims before it was conquered by four Germans in 1938. It wasn't until 1947 that the second successful ascent was made, this time by two Frenchmen. Then, astonishingly, in one summer, 1952, twenty persons reached the top. After that, the Eiger claimed a new string of nine victims, and it wasn't until 1959 that any other climber achieved the summit.

Man in comparison with the animals he once hunted has changed dramatically through the ages. Jacob Bronowski observed that 'the ancestor of man that hunted its ancestor two million years ago would at once recognize the Top. antelope today. But he would not recognize the hunter today, black or white, as his own descendant.'

Nearly 1,000 people live on every square mile of Holland, making it the most densely populated sizable country in the world. (The U.S. has 50 people per square mile, England has 790.)

The Philippines consist of 7,100 islands. (The land area is about that of Arizona.)

Half of the world's population lives in just four countries: China, India, the Soviet Union, and the United States. The other half lives in more than 160 countries. (China alone has almost one-quarter of the world's 4 billion people.)

Rarely seen is the longest mountain range in the world. Most of it lies buried beneath the sea. It is the Mid-Atlantic Ridge, which runs 10,000 miles from Iceland toward Antarctica. The tallest mountain is more than five miles high. The tallest point in the range above water is the more than mile-high island of Pico in the Azores.

Man spews nearly a billion tons of pollutants into the Earth's atmospheric envelope every year.

Pesticides used in agriculture and carried out to the ocean follow currents and concentrate as they go along the marine food chain. When twenty whales, born and bred in the East Greenland current from the North Pole, were harpooned for

test purposes, six identifiable pesticides, including DDT, were found in the blubber of all of them.

If a set of fine scales is arranged so that one scale is kept dark, and light is allowed to fall on the other, the lighted scale will sink slowly. Light has 'weight.' The pressure of light on the Earth's surface is calculated at two pounds per square mile.

The spinning of the Earth has an effect on moving objects. It deflects them and causes them to turn slightly to the right in the Northern Hemisphere, while in the Southern Hemisphere they turn to the left. The 'Coriolis effect' works equally on a ball and on a ballistic missile.

Earth's magnetic field has flip-flopped, north and south, at least 171 times. The reversals have been confirmed in rocks in many parts of the world and dated by fossils and radioactive isotopes.

The North and South Poles trace a complete circle relative to the stars every 26,000 years.

Though certain valleys in Antarctica are the driest spots on Earth, they have more water than does any place on or above the surface of Mars.

There are small ice-free patches of land in Antarctica. Altogether, it comes to an area of 2,900 square miles or 0.06 percent of Antarctica's area. The patches are kept bare by the wind.

There are tiny ponds of water in Antarctica, perhaps caused by hot spots in the land beneath. The ponds are small. One of them, San Juan Pond, has enough water to fill six average-

size American living rooms. The only form of life in it is one species of bacterium.

There is no native human population in Antarctica, nor are there any large land animals. There are only a few species that are adapted to the Antarctic environment, but individuals of these few species are numberless. In summer, there is microscopic life in the ponds, tiny wingless insects live in patches of moss and lichens, and two types of plants send forth flowers.

To view the wonders of the undersea world that no other man had probably seen, Admiral R. J. Galanson, chief of U.S. Naval Materials, peered through the portholes of a U.S. Navy deep-submergence craft nearly half a mile below the surface of the Pacific Ocean. The first thing he saw on the ocean floor was an empty beer can.

The Pacific Ocean fills nearly a complete hemisphere of the Earth's surface.

In the world's northernmost city, Tromsø, Norway, during the period of May 21 through July 23 when the sun is visible round the clock every day, most people act like little kids who never want to go to bed - some even try to fly like butterflies. However, during *mørketiden*, the Arctic darkness, when the sun is never seen, many people in Tromsø say they lose all energy. A number of ills are attributed to *mørketiden*.

An ambitious plan for an international map of the world on a uniform scale has been perfected, but only part of the plan has been completed. Designed by the German Albrecht Penck, and presented to several meetings of the International Geographical Congress in 1891, 1909, 1913, the map would consist of about 1,500 sheets, each covering four degrees of

latitude and six degrees of longitude in a modified conic projection, on a scale of 1:1,000,000.

Instruments record some half-million seismic or microseismic disturbances of Earth each year. One hundred thousand are felt, and one thousand cause damage.

Up to 150 tons of meteorite fragments slam into Earth every year. As far as is known, only seven people have been struck by such rocks from space.

PAMPERED PETS

Every year in the U.S. four times the amount of money spent on baby food is spent on pet food, totaling $1.5 billion.

Napoleon suffered from ailurophobia, the fear of cats.

As a young man, Albert Payson Terhune, a parson's son so much wanted to be a writer that in the pursuit of material he purported to be a leper and entered a Near Eastern leper house. Later, he fought six leading heavyweight boxers. Neither his experience as a leper nor his brief career as a prizefighter brought him into the publishing limelight. Fame and fortune came to him only when he wrote about a subject close at hand, his collie *Lad: A Dog*. First published in 1919, it is still in print.

Until the "pooper-scooper" law was passed in 1978, the 500,000 dogs in New York City deposited 1.75 tons of fecal matter onto its streets each day. The law requires dog owners to clean up after their dogs, on penalty of fines up to $100. Most dog owners comply, and New York City is much cleaner.

The reproductive system of female cats is similar to that of human females, but cats do not ovulate except during copulation. When the male withdraws his penis, the female cries out in pain because the penis has barbs that are felt only during withdrawal from the vagina. It may be this scraping that causes ovulation to begin.

One of the most famous dogs who ever lived was a homeless

Skye terrier named Bobby. As a puppy, he attached himself to an elderly Scottish shepherd named Auld Jock. Jock died in 1858, and for the next fourteen years Bobby guarded his master's grave day and night. He would leave it briefly each day, only to go to the same restaurant where his master used to go. He'd be given food and would eat it near the grave. The citizens of Edinburgh erected a shelter to shield Bobby from the cold winters, and when he died in 1872, he was buried beside Auld Jock.

Betsy, a chimpanzee at the Baltimore zoo, has had sixty-five of her paintings sold - one of them going for $75. Congo, a chimp at the London zoo, is not so 'commercial' an artist as Betsy but has made over 400 paintings. If anyone tries to urge Congo to go on with a painting after he considers it finished, the chimp draws lines in all directions that, in effect, cross out and destroy the painting.

The parachute was invented over a century before airplanes were. The first parachute was built by a French balloonist, Jean Pierre Francois Blanchard. The first parachute jump was made by a dog in a basket, which Blanchard had attached to the parachute and dropped from a balloon, in 1785.

A cat fell from the twentieth floor of a building in Montreal, in 1973, and suffered only a pelvis fracture.

It's generally agreed by the principals that the most important campaign speech each gave centered on the same subject: his dog. In 1944, President Franklin Roosevelt put to shame those Republicans who had accused him of sending an American destroyer to Alaska to pick up his Scottie, Fala. 'I am accustomed,' he said, 'to hearing malicious falsehoods about myself ... but I think I have a right to resent, to object to libelous statements about my dog.' Richard Nixon's 'Checkers Speech,' when he was the Republican Vice

Presidential candidate in 1952, was designed to defend himself against charges that he was the beneficiary of a secret political fund ' , and you know, the kids, like all kids, loved the dog a gift from a Texas supporter and I just want to say this, right now, that regardless of what they say about it, we are going to keep it.'

POLITICS AND POLITICIANS

When American public opinion expressed disappointment with President Theodore Roosevelt's inability to get Japan and Russia quickly to sign a peace treaty at Portsmouth, New Hampshire, the President set out to divert the nation's attention. He ordered the Navy's tiny submarine U.S.S. *Plunger* to Long Island, where he boarded it in a gale. By thus becoming the first President to dive beneath the sea in a sub, he was able to make waves that grabbed the headlines away from the peace-making snarl. The treaty was signed later in the year, and T.R. subsequently was awarded the Nobel Peace Prize.

At the Yalta Conference in February 1945, Churchill was an ailing septuagenarian; Roosevelt, very ill, maintained a brittle contact with life; Roosevelt's chief adviser, Harry Hopkins, was dying of cancer. Only Stalin was in good health.

The American Liberty League, dedicated to laissez-faire capitalism, plotted with big business leaders to usurp the power of President Franklin Roosevelt and to take effective control of the Executive with the installation of its own 'Secretary of General Affairs.' The League asked retired Marine Corps general (and two-time Medal of Honor winner) Smedley Darlington Butler to mobilize and command an army of 500,000 veterans that the league claimed would force F D R into accepting 'the popular will.' General Butler, instead, reported the plot to the House Un-American Activities Committee. Though the general was a reliable witness, and every word was verified by the Congressional group, the House didn't take the cabal

seriously. The league disbanded because, it said, its objectives had been accomplished. The real reason for disbandment was that the plotters had been unmasked and further agitation would have provoked a serious high level investigation.

On the eve of World War II, Winston Churchill was accused by an American Congressman of having served with the Spanish against the United States during the Spanish-American War. Churchill had tried to squelch the persistent rumors that he had been in Cuba during that time. Actually, he had been vacationing in Cuba several years earlier, during the time the Cubans launched an insurrection against the Spaniards, and, as a British officer, he had been permitted out of courtesy to remain as an observer.

Karl Marx was targeted for assassination when he met with two Prussian officers in his house in Cologne in 1848. Marx had friends among the German labor unions, and he was considered a threat to the autocrats. Dressed in his bathrobe, he forced the officers out at the point of a revolver, which, it turned out, was not loaded.

'A democracy – that is a government of all the people, by all the people, for all the people ' was written by Thomas Parker in 1850, and repeated by him in subsequent speeches. Some of Parker's sermons and addresses came to the attention of Abraham Lincoln, who is said to have marked with pencil this portion of Parker's speech of July 4, 1858: 'Democracy is direct self-government, over all the people, by all the people, for all the people.' He used part of it in his Gettysburg Address.

Residential, economic, or educational qualification gave half a million Englishmen more than one vote in England in 1885. A university graduate who also owned a business in the City

of London voted three times – once at his home, once for his university, and once in the City.

The influential historian Arnold Toynbee genuinely admired Adolf Hitler – and vice versa. After a private lecture from Hitler, Toynbee wrote, 'I cannot think of any academic lecturer to whom I have ever listened who could have spoken continuously for that length of time without ever losing the thread of his argument.' But whenever the Nazi leader thought and spoke about Russia, 'he genuinely went crazy' – his voice became raucous and its pitch rose to a hoarse shriek.

Seventy-three parties were on the ballot for an election in Italy in 1968. One was Friends of the Moon, which sported exactly one candidate.

When he resigned in 1923 because of illegal behavior in the Teapot Dome Affair, Secretary of the Interior Albert Fall was offered an appointment to the Supreme Court by President Harding. In 1931, Fall was tried and found guilty of conspiracy to defraud the government.

Political candidates on the hustings often absent-mindedly shake hands with their spouse.

Theodore Roosevelt's mother and first wife died on the same day in 1884. He was so bereaved that he left politics for almost two years.

Though President Eisenhower, a Republican, won re-election by a landslide in 1956, Democrats gained control of both Houses of Congress, the first time in 108 years that the party of the incoming President did not have control of at least one House.

Senator Richard M. Nixon in his denunciation of the Truman Administration in Boston in 1952: "This Administration has proved that it is utterly incapable of cleaning out the corruption which has covered and corroded the entire executive branch of the government. It has undermined the confidence and faith of the people in the integrity and honesty of their government employees." The originator of the Watergate tapes also expressed horror at Truman's earthy language.

Daniel Webster, a leading U.S. political figure for thirty-five years in the nineteenth century, was on the take from Nicholas Biddle and Biddle's Second Bank of the U.S. Webster once wrote to Biddle to complain that "my retainer has not been renewed, or refreshed as usual."

A Senate debate on Kansas statehood in 1856 climaxed when Representative Preston Brooks of South Carolina caned whipped into senselessness Senator Charles Sumner of Massachusetts. Sumner had insulted Brooks's uncle, the absent Senator Andrew P. Butler, of South Carolina during a diatribe against the "harlot slavery" and "rape" of Kansas as "slurrings picked from the drunken spew and vomit of an uneasy civilization." Sumner was so badly injured he could not return to the Senate for three and a half years, and he was in pain for the rest of his life. Brooks resigned after the incident, but was reelected as a hero by his district.

Not until 1969 did a United States Supreme Court Justice (Abe Fortas) have to resign under fire.

For construction of the Sam Rayburn House Office Building, the Congressional bill appropriated $2 million plus "such additional sums as may be necessary." Such additional sums eventually totaled $88 million.

A medieval Frenchman established the Parliament of England in its modern form. Simon de Montfort went to England, led a revolt against Henry III, and became master of the realm. To gain support, in 1265, he summoned to Parliament representatives of the boroughs for the first time. His Parliamentary reform survives to this day

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Two brothers competed for the Presidential nomination of the Republican convention in 1884 Senator John Sherman of Ohio and General William Tecumesh Sherman On the first ballot, the senator received thirty votes and the general, two. On the fourth ballot, neither of the Shermans received a vote, but James Gillespie Blaine, of Maine, received enough votes to gain the nomination

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In 1920, Eugene Debs was nominated for President of the United States by the Socialist Party while he was serving a prison sentence for sedition during World War I He has been the only man to run for President from prison. He received nearly a million votes, or 3.5 percent of the total.

Should New York City secede either from the Union or from the state of New York? The question has been raised repeatedly. In 1778, it was feared that New York would not join the Union Some New York City politicians proposed that the city secede from New York State and join New Jersey or Connecticut In 1804, there was an abortive plot to form a Northern Confederacy, of which New York City would have been a part In 1861, Mayor Fernando Wood proposed that the city secede from the Union In 1969, mayoral candidate Norman Mailer proposed that the city secede from New York State and become the fifty first state

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While serving in Congress, Thomas Jefferson introduced a bill that attempted to bar slavery from all future states admitted to

the Union, a measure that might later have prevented the Civil War if it had not been defeated – by a single vote.

The first American political party to hold a Presidential nominating convention was the Anti Mason Party, which convened in Baltimore in September 1831. Their candidate in the 1832 election was William Wirt, who was ironically a Mason. His ticket carried only the state of Vermont in the election.)

For a brief while, there was reason to suppose that the Democrats in 1900 might try to counter Republican military glory by nominating for President Admiral George Dewey, the hero of the just-concluded Spanish-American War. But there was an insurmountable barrier: Dewey's wife was Catholic. The South was the core of Democratic power, and strongly Protestant, and that put Dewey completely out of contention.

The first and only Congressman to be jailed for criticizing the President was Matthew Lyon of Vermont, in 1798. He had attacked President John Adams's plainly unconstitutional Sedition Act, which forbade defamation of the government or its officers. The law was repealed during the Jefferson Administration.

Benito Mussolini was originally one of the most vocal critics of Adolf Hitler. Il Duce formed his pre-World War II union with the German dictator only when the free nations of the world censured him for his attack on Ethiopia.

In the early nineteenth century, the English cities of Leeds, Birmingham, and Manchester had a population of nearly 500,000, but no members of Parliament. Old Sarum, a 'field and ancient earthwork' without population, had two members by ancient custom. This 'rotten borough' system

allowed the British establishment to control Parliamentary seats, and rotten boroughs lasted until the Great Reform Act of 1832.

President Theodore Roosevelt, in a highly controversial case, withheld announcement until after the Presidential election of 1908 that the 167 'Brownsville raiders' had been cashiered out of the army by executive order without trial. (In 1906 a group of black soldiers stationed at Fort Brown, Texas, were blamed for a night raid on Brownsville that resulted in the death of a citizen, although no evidence of proof was produced.) A preelection statement, the President felt, would hurt the candidacy of his handpicked successor, Secretary of War William Howard Taft, who indeed went on to win the campaign. Nevertheless, the 1908 election marked a swing by the black vote from its traditional affinity with the Republican Party. It was a watershed in the development of black power. Recently, as a result of 'administrative review,' the records of the raiders – now all dead – were cleared of the offense of nearly seventy years earlier

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Even before he got there, in 1630, John Winthrop was elected first governor of Massachusetts Bay Colony, in 1629, and was reelected governor eleven additional times. He died in office, in 1649, at the age of sixty-one.

In 1954, Vice-President Richard M Nixon wrote out on a piece of paper a promise to his wife that he would never again seek public office After showing it to his wife, Mr Nixon folded the paper and tucked it into his wallet.

Victor Berger was elected a United States congressman by the state of Wisconsin in 1920, but the House of Representatives by a vote of 328 to 6 refused to seat him because he was a Socialist who had vigorously opposed U S participation in World War I.

A threat of a new U S Civil War hung over the outcome of the supercharged and highly controversial Presidential election of 1876, 'the stolen election' The Democratic candidate was the reform governor of New York, Samuel Jones Tilden He received a majority of the popular vote, but because of a secret deal lost the election to Rutherford B Hayes, the Republican candidate, by one vote of a specially created Electoral Commission In return for getting their candidate into the White House, the Republicans in Congress agreed to make concessions to the South that included the withdrawal of federal troops Tilden accepted the arrangement, which was the alternative to violence and marked the end of the Reconstruction government and the beginning of the Democrats hold on the South

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The only time in United States history that the President and Vice-President were members of different political parties occured when Thomas Jefferson, a Republican, became Vice-President under John Adams, a Federalist, in 1797

One Vice-President of the Unites Sates - but not President - took the oath of office on foreign soil William Rufus De Vane King was elected Vice-President in 1852, when Franklin Pierce was elected President. By a special Act of Congress, King was sworn in Havana, Cuba, by the U S consul there, William L Sharkey King never got to perform any of the duties of his office, and therefore never presided over the Senate, for he died a month after being sworn in and the first session of the 33rd Congress had not been held King held another distinction He was the only Vice-President to have served in both houses of Congress representing a different state in each He was Representative King from North Carolina from 1811 to 1816, and Senator King from Alabama from 1819 to 1844 and again from 1848 to 1852.

Representatives of several Southern states met in Cleveland

in 1838 and openly discussed an invasion of Canada They framed a constitution for 'Free Canada' and made arrangements for the issuance of invasion currency President Van Buren responded: 'This Government recognizes a still higher obligation to repress all attempts on the part of its citizens to disturb the peace of a country where order prevails, or has been re-established.' (Later the same year, the President hailed the removal of the Cherokee Indian tribe – by force – to new lands in the West.)

In the first 183 years of the United States, the country had no Vice-President for thirty-seven years and 159 days, almost one-fifth of the time. Seventeen Vice-Presidents did not complete their terms; seven died, two resigned, and eight succeeded to the Presidency.

The House of Representatives and the Senate in 1854 set aside 10 million acres of public lands, in several states, for asylums for the indigent insane The law was reluctantly vetoed by President Pierce on the constitutional ground that Congress did not have the authority to make such a provision. The veto was sustained.

The Credit Mobilier (1864-72), a trust that plundered the Union Pacific railroad funds, was helped by congressmen, including James Garfield, who received free shares and dividends. When the exposé occurred, Garfield tried to deny his involvement. Despite his pocket-padding at public expense, he was reelected to Congress three more times by his Ohio constituents. The people of America then elected him President.

In its effort to help the U.S win the hearts and minds of the people of North Vietnam, in 1972, the Committee to Re-elect the President (Richard Nixon) put together thousands of

'Democracy Kits' for parachuting into North Vietnam. The kit included a pen-and-pencil set decorated with the Presidential seal and the signature of the President. The sets were similar to those presented to generous political contributors. The kits were never dropped into North Vietnam.

Much has been made in recent years of the instability of Italian governments - at least twenty-nine since World War II. Compared with the Third Republic in France between 1881 and 1914, when there were forty-two different governments, and between World Wars I and II, when there were forty more changes, the Italians look relatively stable.

Richard M. Nixon got his start in national politics indirectly through a newspaper appeal. Republicans in the Twelfth Congressional District of California needed a sacrificial candidate to run in 1946, and Nixon responded to the 'help wanted' announcement. He waged a shrewd, tough, and below-the-belt campaign, and defeated the incumbent congressman, Jerry Voorhis, a nationally known New Deal Democrat.

Joseph Stalin studied for the priesthood in a Russian theological seminary in Tiflis, in Georgia, for five years (1894-99). He was a model student until he became aware of the liberal political ideas that permeated the town. He became a Marxist and joined the Social Democrat Party. Because of this, he was expelled by the seminary.

The original Bill of Rights proposed by Congress as an addition to the U. S. Constitution contained twelve, not ten, amendments. The two that failed to be ratified by the states were an amendment to set the size of the House of Representatives and one that would have prevented congressmen and senators from raising their own salaries.

Though Nevada did not have a population large enough to qualify for statehood, President Lincoln rammed through its admission to the Union in order to line up another vote ratifying the thirteenth, or antislavery, amendment to the Constitution.

The idea for the Monroe Doctrine was originally proposed not by James Monroe but by the British secretary for foreign affairs, George Canning, in August 1823. He suggested to the United States that it and England unite in opposing European expansion in the Western Hemisphere. Besides safeguarding America, the policy would help England maintain the balance of power in Europe. John Quincy Adams, then President Monroe's Secretary of State, disagreed with Canning's suggestion and got Monroe to announce unilaterally on December 2, 1823, that the U.S. alone would oppose any European attempt to subject to their political systems the nations of the New World.

Two British Prime Ministers, Clement Attlee and Winston Churchill, when they were children, had the same governess.

William March "Boss" Tweed was so corrupt as the head of Tammany Hall, the organization that controlled New York City politics after the Civil War, that he may have cost the city as much as $200 million through padded and fictitious charges and through tax favors.

A president of the Republic of Ireland - Eamon de Valera - was born in New York City, in 1882.

Jacob Sechler Coxey, mayor of Massillon, Ohio, and 20,000 unemployed began a march in 1893 to Washington to demand public building programs - mainly railroads - for the unemployed of the nation. Only 600 men had persisted through the length of the march when 'Coxey's army'

reached Washington on May 1, 1894, and walked along Pennsylvania Avenue. Before General Coxey could make a speech, he was arrested by District police for walking on the grass. Coxey lived until 1951, when he died at ninety-seven.

When he wasn't waging wars of revolution, Giuseppe Garibaldi took on a variety of jobs. They included selling spaghetti in Uruguay and making candles in Staten Island, New York.

Captain John Smith was to have been a member of the first governing council of Jamestown in Virginia when the first colonists arrived in 1607. But when the orders from the Virginia Company of London containing his name were opened and read, the colonists immediately voted to deny him the leadership post because he had been mutinous on the voyage from England. He was reappointed when a religious leader interceded.

The technocracy movement, popular in California during the Depression, called for placing the government in the hands of scientists and engineers, the end of the profit system, the application of all modern technologies and discoveries to the alleviation of human want, a working-age from twenty-five years to forty-five years, and a work year of 132 days.

The Working Man's Party, the first labor-oriented political party in America, and probably in the world, lasted only two years, 1828–30. It started in Philadelphia and New York. Members demanded a ten-hour working day, abolition of imprisonment for debt, and more public schools. While the party did exert some influence in its time, it failed over doctrine, many members refusing to accept their leaders' radical demands.

Winston Churchill failed in his first two attempts to gain

admittance to Sandhurst, the British army school, and his father considered using his social connections with the Rothschilds in order to obtain Winston a position in business. However, Winston was tutored for the Sandhurst exam and passed - barely - on his third try. His father was greatly displeased by the marks and wrote a scathing letter predicting his son's future to be that of a 'wastrel' leading a futile life.

It was in spite of President Andrew Johnson's veto that blacks were given the vote in the District of Columbia, in 1867

Except for five votes in the U.S Senate, the Panama Canal would have been built in Nicaragua.

Although the U S Constitution provided for the establishment of embassies abroad, the first ambassadors were not appointed until 1893, more than a century after the nation was founded Instead of ambassadors, the U.S. had been represented through ministries headed by ministers or through consulates. Ambassadors were considered to be a device of monarchies, and no President until Grover Cleveland was willing to risk being charged with having monarchial pretensions

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Because the House of Representatives was more interested in punishing President Andrew Johnson than in buying Alaska, and because American public opinion was not enthusiastic about territorial expansion, the Russians negotiating the sale of Alaska to the U S employed well over $100,000 on propaganda Some of the money was placed directly into the eager hands of a few selected congressmen

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Napoleon, after his defeat at Waterloo in 1815 hoped to find asylum in England, but instead was shipped as a prisoner of war to the British-governed South Atlantic island of St Helena. It was not until 1840, almost twenty years after his

death and after many years of negotiation that the British released the body to the French at the request of Louis Philippe, for entombment under the dome of the Hotel des Invalides in Paris.

PRESIDENTS

In the United States, the presidential candidate usually chooses his vice-presidential running mate on the basis of his vote-getting qualities, particularly in his home state. Yet, through 1976, in eighteen of the twenty-six Presidential elections since the Civil War, vice-presidential candidates on the losing major party ticket did not win in their home states.

Nine of the thirty-nine U.S. Presidents did not attend college. Truman, Cleveland, Andrew Johnson, Lincoln, Fillmore, Taylor, Van Buren, Jackson, and Washington.

Jimmy Carter is the first President to have been born in a hospital. All thirty-eight previous Presidents were born at home.

While most people are aware of the blood relationships that existed between the Adamses (father and son), the Harrisons (grandfather and grandson), and the Roosevelts (distant cousins), few are aware that President Harry Truman was distantly related to President John Tyler. Truman's paternal grandmother was a direct descendant of Tyler's brother. Tyler, like Truman, was a Vice-President who became President on the death of his predecessor. Aides planned to run the government, but Tyler wanted to be his own man. Truman was equally adamant and attributed the trait to his Tyler blood.

Charles Joseph Bonaparte, a grandson of Napoleon's younger brother, Jerome, served as Secretary of the Navy in President

Theodore Roosevelt's cabinet and as T R 's attorney general

Only one President has held a Ph D degree - Woodrow Wilson.

Presidents of the U S have taken the oath of office aboard a jet airplane in Texas, in a brownstone in New York, in a farmhouse in Vermont, in the back porch of the White House under the portico of the Capitol and in the Wall Street district of New York

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Not until 1967 was there a Constitutional provision for electing or appointing a new Vice President when the elected Vice-President had succeeded to the Presidency The Twenty fifth Amendment states that whenever there is a vacancy in the office of the Vice President the President shall nominate a Vice President who shall take the office upon confirmation by a majority vote of both houses of Congress (The amendment has been used twice already President Nixon named Gerald Ford to succeed Spiro Agnew in 1973, and President Ford named Nelson A Rockefeller to fill the second highest office in the nation when Ford succeeded Nixon in 1974.)

The middle initial in Harry S Truman's name stands for nothing That's why it is often written without a period after it His parents chose the S to avoid favoritism because both his grandfathers had names beginning with S

President William Howard Taft weighed 350 pounds He got stuck in a bathtub in the White House and someone had to be called to pull him out He then had a special tub made It was so big that, when it was delivered, four White House workmen climbed into it and had their picture taken

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Franklin Pierce, the fourteenth President of the United States, was an alcoholic. His wife undertook to control his behavior, and her influence led him away from the drunken pranks and tavern brawls that marked his youth. After her death, he spent his last years succumbing to his drinking problem.

Not more than a half-dozen people in the country knew that President Theodore Roosevelt had lost the sight of his left eye. He was struck in the eye during a vigorous boxing exercise with a young army officer, in 1904, and his vision became dimmer and dimmer until there was no sight at all from 1908 on. T.R. was sensitive over the defect, and carefully avoided giving the impression that he was using only one eye.

The chief drafter of the U.S. Constitution and twice President of the U.S. was a lightweight on the scales. James Madison weighed in at only one hundred pounds. He was the shortest President, at five feet four inches.

During one five-week span in 1841, three different men served as President of the United States. Martin Van Buren finished his term on March 3. The following day, his successor, William Henry Harrison, was inaugurated. Harrison died after only thirty-two days in office, and John Tyler became President on April 6.

The first inaugural address of President Franklin Roosevelt was broadcast by radio and resulted in the unprecedented number of 500,000 pieces of mail to the White House.

Abraham Lincoln was convinced all his life that he, like his mother, Nancy Hanks, was illegitimate, and he observed that 'bastards are generally smarter, shrewder, and more intelli-

gent than others." Not until after his assassination was it proved that Lincoln had been illegitimate.

Only one President subsequently served in the House of Representatives. John Quincy Adams, President from 1825 to 1829, was elected to the House in 1831, remarking that "No election or appointment conferred on me ever gave me so much pleasure." He served until his death in 1848, from a stroke suffered in the House chamber.

One President, Franklin Delano Roosevelt, was related to eleven Presidents, six by marriage, five by blood. Theodore Roosevelt was F. D. R.'s fifth cousin, and was President — and in attendance — when F. D. R. married cousin Eleanor, in 1905. The others to whom F. D. R. was related were Washington, the two Adamses, Madison, Van Buren, the two Harrisons, Taylor, Grant, and Taft.

President Lincoln's successor, Andrew Johnson, never went to school. He had not learned to write and could barely read when his wife undertook teaching him these skills.

Only one President subsequently became Chief Justice of the Supreme Court. William Howard Taft, President from 1909 to 1913, ran for reelection against his will, and finished last in a field of three, behind the victorious Democrat Woodrow Wilson and Theodore Roosevelt, who had come out of retirement to run on the Bull Moose ticket. Taft achieved his life's ambition when he was appointed Chief Justice by President Warren G. Harding in 1921. He served until ill health forced him to resign in 1930, a month before his death.

It took the Franklin Delano Roosevelt Memorial Commission twenty-three years (1955–78, of study and 500 designs and a $1.7 million expenditure to agree on a site and an

architectural plan for commemorating the nation's only third- and fourth-term President. The memorial is slated to be a 1,000 foot-long granite wall, which will meander between the Tidal Basin and Potomac River in Washington, D.C.

About two-thirds of U.S. Presidents have served in various branches of the armed forces or state militia units. Only five have served in the Navy, and they are the five most recent Presidents - Kennedy, Johnson, Nixon, Ford, Carter.

On his inauguration day in 1829, Andrew Jackson had to climb over a wall and enter the Capitol from the basement in order to avoid boisterous mobs that thronged the Capitol in celebration.

President James Garfield seems to have had a premonition of his assassination. Two days before a disappointed office-seeker murdered him in 1881, Garfield asked Robert Todd Lincoln, a son of the late President, to relate his memories of Lincoln's assassination.

The U.S. technically had two Presidents when Rutherford B. Hayes was sworn before the designated date, the only time this has happened. To blunt the possibility that Samuel Tilden would forcibly assume the office after losing the Presidency to him by one controversial electoral vote, Hayes, while dining with President Grant at the White House on the eve of the scheduled inauguration, slipped with Grant and Chief Justice Morrison R. Waite into the Red Room and quietly took the oath of office. The next day, Hayes officially was administered the oath of the President on the east steps of the Capitol building.

Abraham Lincoln was distantly related by marriage to Paul

Revere Lincoln's father, Thomas, was the cousin of Amos and Jedediah Lincoln, both of whom were sons-in-law of Revere. Thomas was a carpenter, like his second cousins, but unlike them he was unsuccessful and shiftless.

President Lincoln's only son to live to manhood, Robert Todd Lincoln, was at hand at the assassinations of three Presidents: his father's, Garfield's, and McKinley's. He was called to the house where his father was dying, he arrived only moments after Garfield was shot in the capital, and McKinley was shot in Buffalo.

For the first thirty-five years, the U.S. President was not elected by the people. Popular vote was first made a part of the Presidential contest in the election for the nation's sixth President, in 1824, but fewer than five percent of the electorate participated in the voting. Prior to 1824 the electoral college alone selected the President, the candidates having been chosen by party caucus. In the 1824 election, the state legislatures nominated the candidates.

Andrew Johnson, who served as Lincoln's second-term Vice-President, and later as President, was nearly lynched by a mob as he was returning home to Tennessee from Lincoln's first inauguration because he was the only Southern Senator who was loyal to the Union on the eve of the Civil War. A mob in Virginia dragged Johnson from a train and put a noose around his neck. They released him only when the suggestion was made that he be allowed to return to Tennessee, which, as his home state, should have the privilege of hanging him.

James K. Polk was the first "dark horse" to be elected a President of the United States. His name was not even mentioned during the first seven ballots at the Democratic National Convention of 1844. He did not receive a single vote until he was suggested as a compromise candidate when a

stalemate developed between former President Martin Van Buren and Lewis Cass on the eighth ballot. On the ninth ballot, Polk was nominated

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After George Washington (1732-99) was elected President, he proposed he should receive no salary, but only be reimbursed for his expenses, as he had been during the Revolution. Congress, however, fixed a salary of $25,000 a year. Although Washington indeed drew only his expenses over the first four years of his Presidency, they amounted almost exactly to what the salary would have been.

In the territory and new state of Tennessee, he was solicitor at twenty-two years of age, U.S. attorney at twenty three, a Congressman at twenty-nine, a U.S. Senator at thirty, and a justice of the state supreme court at thirty-one. He gained these positions without particularly strong political ambitions, and he readily resigned each after brief tenure. Andrew Jackson went on to become the seventh U.S. President and served two full terms.

John Tyler, tenth President of the United States, later served as a member of the Confederate House of Representatives for a brief period before he died in 1862. He's been the only President to renounce the Union.

Though it was not diagnosed until he had returned to Washington, Abraham Lincoln was suffering a mild case of smallpox when he delivered his historic address commemorating the new cemetery at Gettysberg, Pennsylvania in November 1863.

Swift to set an example, President Theodore Roosevelt in his fifties (January 1909) didn't 'spare the horse' when he rode a hundred miles over rough roads to Warrenton, Virginia, in

order to shame the Army, which had complained of an order to keep physically fit

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After being shot in the chest by an insane saloonkeeper who opposed his third-term candidacy, Theodore Roosevelt ('bleeding like a wounded bull moose') went on to finish the speech he was delivering in Milwaukee, in 1912 before he accepted medical care.

The U.S. was without a working President for the last seventeen months of Woodrow Wilson's second term. After his disabling stroke, Wilson lay or dozed in the White House, unable to carry out his duties. No move was made to remove the President from office. His wife, Edith, was supposed to have unobtrusively performed many of the Presidential functions.

The Republican party wanted to know if its potential candidate for President in 1920, Warren Harding, of Ohio, had anything in his present life or in his past that might, on disclosure, result in a cause célèbre, embarrass the Presidency or cost the candidate the victory. Harding said he was as clean as a hound's tooth. He won the nomination and the national election. It later was revealed that Harding, who was married, had at the time a mistress who was to bear him a child.

The media made a big deal out of two little words nestling in Governor Franklin D. Roosevelt's acceptance speech at the Democratic Presidential nominating convention in Chicago in 1932. The words were 'new deal.' F.D.R. had flown in a flimsy trimotor airplane from Albany, New York, to Chicago to accept the nomination rather than to follow tradition and acknowledge it weeks later. The nation was gripped by the Depression, and Roosevelt was seen as the man on the white horse, the savior. He told the cheering convention: 'I pledge you, I pledge myself, to a new deal for the American people.'

The phrase 'new deal' had meant little to the nominee, and to his speechwriters, but columnists and cartoonists quickly ballooned it into a rallying cry. The day after the speech, there appeared a cartoon by Rollin Kirby showing a 'man with a hoe' (the title of Edwin Markham's famous poem of protest against exploitation of labor) looking up puzzled but hopeful at an airplane labeled 'New Deal.' So effective was 'New Deal' that politicians have tried to create a winning catch phrase in each election thereafter.

James Buchanan has been the only bachelor to serve as President of the United States.

President Andrew Johnson's 'crime' that led to impeachment proceedings against him was that he carried out his duty to obey the Constitution as he understood it. He was acquitted by one vote in May 1868. On March 2, 1867, the U. S. Congress had passed the Tenure of Office Act over Johnson's veto. Still, he tried to force his Secretary of War, Edward M. Stanton, out of office because Stanton was suspected of undermining Johnson's programs. Despite the fact that Johnson did not fire Stanton, Congress acted against Johnson for trying.

William Henry Harrison rode into the White House in 1841 on the impetus of a brief but bloody battle against an Indian stronghold near Tippecanoe Creek, Indiana, on November 7, 1811. The battle was celebrated as a great victory and made Harrison a national hero. Actually, it was indecisive, and U. S. military losses were far heavier than those of the Indians.

When he became governor of New Jersey in 1911, Woodrow Wilson had never before held public office. One year and ten months later, he was elected President of the U. S.

The man who cast the single vote that elected Thomas Jefferson President over Aaron Burr - William C C Claiborne (1775-1817 - had been elected to Congress before he was of constitutional age

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Charles Willson Peale, painter of more than 50 American Revolutionary contemporaries, was a master tinker For George Washington's inauguration in Philadelphia in 1793, he built a triumphal arch As the general rode beneath Peale's daughter Angelica pulled a concealed string and with accurate aim dropped a laurel wreath on the first President's head.

So short (five feet six inches and chubby was John Adams that he was known as His Rotundity' His Presidency was sandwiched between those of two six-footers Washington (six two and Jefferson six-two and a half

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Not until Herbert Hoover was President, in 1929, did the U S Chief Executive have a private telephone in his office (The telephone had been invented fifty three years earlier) The booth in a White House hallway had served as the President's private phone before one was installed in the Oval Office

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Twenty percent of U S Presidents were born in the same state Virginia Nearly 40 percent were born in either Virginia or Ohio eight in Virginia, seven in Ohio

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Only two Presidents of the United States, James K Polk and Woodrow Wilson, have been elected without winning the vote of their home state.

To thwart a suspected assassination attempt by secessionists in volatile Baltimore, President elect Lincoln changed his

travel plans for reaching Washington for his inauguration He left Harrisburg, Pennsylvania, after a speaking engagement, by night instead of by day as originally announced, and was escorted by a heavily armed friend He arrived in Baltimore, switched trains in the wee hours of the morning, and embarked safely for the capital.

Until 1826, white people in the United States were sold as indentured servants who would be freed after a certain period of time. Andrew Johnson, who became President in 1865, was a runaway white slave; advertisements appeared in newspapers in an attempt to get him back.

When he was nominated for President at the Republican convention in 1880, James A Garfield did not get a single delegate vote on the first ballot He got one vote, from a delegate from Pennsylvania, on the second, third, fourth, and fifth ballots. He did not get a single vote in the fourteenth, fifteenth, sixteenth, seventeenth, and eighteenth ballots He won the nomination on the thirty-sixth ballot, with 399 of the 756 votes, the largest number of ballots cast at a Republican convention up to that time. Garfield won the Presidency, squeezing past with a plurality of 9,464 votes out of a total of almost 9 million cast. He was assassinated the following year.

Not until 1845, when the issue was payment for naval vessels ordered by President John Tyler, did Congress override a Presidential veto Congress had passed a bill providing that no revenue cutter could be built unless an appropriation law was passed by Congress Tyler vetoed it on grounds that a contract for two revenue cutters already had been let On March 3, 1845, the Senate overrode the veto, 41 to 1, and the House of Representatives overrode it, 127 to 30.

John Quincy Adams, when his alma mater, Harvard, conferred a doctor of laws degree upon President Andrew

Jackson, Adams's successor in the White House, said. "Myself an affectionate child of our alma mater, I would not be present to witness her disgrace in conferring her highest literary honors upon a barbarian who could not write a sentence of grammar and hardly could spell his own name."

In 1848 when Zachary Taylor was nominated for President by the Whig Party prepayment of postage was optional. When Taylor's supporters did not receive a response to their letter offering the nomination to Taylor, they thought he was not interested. It was later determined that the notification had been sent collect on delivery, and the popular hero of the Mexican War made it a practice to accept only prepaid mail. (Prepayment of postage became compulsory in 1855.)

The longest Presidential inaugural address – nearly two hours – 8,445 words, almost twice as many as any other President's – was delivered during a snowfall by a hatless, coatless William Henry Harrison in 1841. He died of pneumonia exactly a month thereafter – his was the shortest administration. Forty-eight years and fourteen Presidencies later, Harrison's grandson Benjamin Harrison successfully withstood torrential rains and strong winds during *his* inaugural.

Technically speaking, the twelfth President of the United States was David Rice Atchison – which would make Zachary Taylor the thirteenth (and Jimmy Carter the fortieth). Atchison was President for a day. James Polk's four-year term had ended constitutionally at noon, Sunday, March 4, 1849, his successor, Zachary Taylor, did not take the oath of office until Monday, March 5, from noon Sunday until the inauguration Monday, there was no President Polk and no President Taylor. Vice-President George Dallas had resigned as president of the Senate on the previous Friday and Missouri's Senator Atchison was elected by the Senate to fill his place *pro tempore*. The Constitution declares that, in the

absence of a President and a Vice-President, the Congress can name a substitute. Atchison, as president of the Senate throughout that weekend, was therefore the legal President of the nation until Taylor was sworn. On his monument in Missouri is written 'David Rice Atchison, 1807-1886, President of the U.S. one day.'

Two Presidents of the United States, George Washington and James Monroe, were unopposed in their quest for the Presidency. Monroe's second election would have been unanimous except for a single dissenting ballot in the Electoral College. It was cast to keep Washington the nation's only unanimously elected President. Until 1824, there was no popular vote.

Though Lyndon B. Johnson's Presidential message of January 8, 1964, was only 3,059 words long, twenty-four writers worked six weeks on the draft and made about sixteen major revisions.

President Millard Fillmore's mother feared her son might have been mentally retarded.

Probably the least politically active of all first families were the Eisenhowers. Until General Eisenhower became the Republican candidate for the Presidency in 1952, Mrs. Eisenhower had never voted, nor was there any record that General Eisenhower had ever voted. Both major political parties had had hopes that Ike would be their candidate.

Sarah T. Hughes was the first woman to swear in a U.S. President. A Federal District Court judge, she administered the oath to Lyndon B. Johnson in Texas soon after President John F. Kennedy's assassination there in 1963.

A committee of the first Senate of the United States voted to have the President referred to as His Highness. The title selected was His Highness the President of the United States of America and the Protector of the Rights of the Same. The House of Representatives did not agree and the title remained simply 'Mr. President.'

President James Garfield, March 4, 1881 to September 19, 1881, invented a device and could write Latin with one hand and Greek with the other simultaneously.

Almost half a century passed before a man born in the United States rather than in the England colonies became President in 1837 - Martin Van Buren, the eighth.

Although George and Martha Washington never lived in the official White House, it wasn't built until after he left office. The Virginia plantation that Martha Custis Washington inherited from her husband was called the White House. It was in this White House that George and Martha were married. John and Abigail Adams also lived in another 'White House.' Theirs was in Braintree, Massachusetts and they moved there in 1768. The Adams couple was much happier there than in the White House in Washington, D.C., which was inhabited when they moved in near the end of Adams' Presidential term. No rooms were completed. With no place to hang out her laundry, Abigail Adams strung up clothes lines in the great unfinished audience room.

In 1947-48, three future Presidents of the United States, Lyndon B. Johnson, John F. Kennedy, and Richard M. Nixon, served in the House of Representatives. In 1833-34, three future Presidents - James K. Polk, Millard Fillmore, and Franklin Pierce - also served together, along with former President John Quincy Adams.

The sixteenth President of the United States, Abraham Lincoln, was the first to be assassinated, but the seventh President, Andrew Jackson, was almost the first. A house painter, Richard Lawrence, was able to get within six feet of Jackson at a funeral service in the Capitol rotunda. Lawrence aimed two pistols and pulled the triggers. Both guns misfired. Lawrence was seized and jailed and later committed to a mental hospital, where he was diagnosed as a monomaniac.

None of the twenty-five U. S. Presidents between the second, John Adams, and Woodrow Wilson, made an appearance before Congress. Wilson broke the century-old precedent on April 8, 1913, emphasizing before a joint session his determination to lead in legislation and to use all his powers as President and leader of the Democratic party.

A campaign issue in John Quincy Adams's unsuccessful reelection campaign of 1828 was the White House expense account: $50 for a billiard table, $6 for billiard balls, $23.50 for chessmen.

Theodore Roosevelt was the first U. S. President to ride in an automobile and the first to fly in an airplane, among many other firsts.

In the fourteen years before the election of 1788 that made George Washington the first President of the United States under the present Constitution, the nation had fourteen different Presidents. They were elected and they served an average of a year apiece, in the period from the First Continental Congress (1774) to the last session of the original Congress (1789). The first President was Peyton Randolph, a Virginia aristocrat, unanimously elected at the first session of Congress in September 1774. John Hancock served two widely spaced terms, including one in absentia.

The first U.S. President to be born in the twentieth century didn't take office until 1961 – John F. Kennedy (1917–1963).

At the time of his inauguration as President of the United States, George Washington was the only head of state of a major country in the world who was not a crowned monarch. There are now far more presidents than monarchs.

John Quincy Adams (sixth President of the U.S., 1825–1829) served the United States in an official capacity for fifty-five years, beginning as private secretary and clerk to the American minister in Russia in 1781 at the age of fourteen.

After being inaugurated earlier in the day as President of the U.S., Thomas Jefferson returned to his boarding house and found it dinner, every accessible seat at the dining room table taken. No man present rose to offer the President his seat, until the wife of John Brown, the senator from Kentucky, offered to yield hers at the most desirable end of the table. But as any Southern gentleman would have, Jefferson declined.

The only tie in the history of American Presidential elections occurred in 1800. Thomas Jefferson and Aaron Burr each received seventy-three electoral votes. The tie occurred because the members of the Electoral College could vote for two men. The top vote-getter became President, the second Vice President. The Republicans had planned to have several electors split their tickets so that Burr would be second to Jefferson in the voting, but each thought others would do so – and none did. The tie forced the election into the House of Representatives, which gave Jefferson the majority by one vote, but only after thirty-five ballots.

An American President cannot be arrested unless he willingly

agrees. When Ulysses S. Grant was stopped while speeding in his carriage in the capital, Grant urged the policeman to take the appropriate action. The President was taken to the police station, but the speeding charge was dropped.

One of the best-kept secrets about U.S. Presidents was the operation for cancer of the mouth that Grover Cleveland underwent in 1893. The operation was performed aboard a yacht cruising New York's East River. Not even the Vice-President knew about it. Cleveland's quick recovery helped to conceal the surgery, which did not become publicly known until a doctor published an account after Cleveland's death.

He

- lost his job in 1832.
- was defeated for the legislature in 1832.
- failed in business in 1833.
- suffered a nervous breakdown in 1836.
- was defeated for speaker of the Illinois state legislature in 1838.
- was defeated for nomination for Congress in 1843.
- lost renomination to Congress in 1848.
- was rejected for land office in 1849.
- was defeated for the Senate in 1854.
- was defeated for nomination for Vice-President in 1856.
- was defeated for the Senate in 1858.
- became the sixteenth President of the U.S. in 1861.

If he had been defeated for reelection in 1916, President Wilson planned to try to turn the government over immediately to his successor, Charles Evans Hughes, rather than spend five months as the lame duck chief executive.

On May 27, 1943, Edwin Barclay, grandson of American slaves and president of the Liberian Republic, became the

first black man to appear as a guest of honor before the United States Congress and be officially introduced from its rostrum. He was repaying the call President Franklin Roosevelt had made to Liberia after the Casablanca Conference.

The true name of President Ulysses Simpson Grant was Hiram Ulysses Grant. The Congressman who recommended Grant for West Point in 1839 thought his first name was Ulysses and guessed that his middle name must be his mother's maiden name, Simpson. Grant adopted the name and used it thereafter, going down in history as Ulysses Simpson Grant.

Abraham Lincoln had a dream on the eve of his first election as President. In a large mirror, he noticed two distinct images of himself, one imposed on the other. One image was much paler that the other. Lincoln told his wife about the dream, and she interpreted it to mean that he would be elected to a second term but would not live through it.

Andrew Jackson married the same woman twice. When he was a young lawyer in Nashville, he and Rachel Robards, a divorcee, became man and wife although her divorce (unknown to them) was not final. Three years later, after the Jacksons learned the true state of affairs, they were remarried. When Jackson ran for President, he was hounded with scurrilous retellings of the story, and his wife died on the eve of his election. He became permanently embittered.

When he received the cable from Admiral George Dewey reporting the capture of Manila, President William McKinley had to look up the location of the Philippines on a globe. 'I could not have told where those damned islands were within 2,000 miles,' he confessed later.

Vice-President-elect Andrew Johnson didn't hold his liquor well, and seemed clearly drunk at his inauguration in 1865. Those who opposed Johnson, especially when he succeeded the assassinated Lincoln to the Presidency, never allowed the public to forget the gaucherie.

Abraham Lincoln claimed that a widely circulated photo of him made in early 1860 by Matthew Brady helped him to become President. The photograph, Lincoln said, 'dispelled the opposition based on the rumors of my ungainly figure.' Cartoons had led the citizenry to think of Lincoln as a gangly and crude backwoods boy, and the photograph showed him to be 'a man of human aspect and dignified bearing.'

When future U.S. President William Howard Taft was president of the Philippine Commission in 1900, Secretary of War Elihu Root cabled him to ask how he was — Root had heard that Taft was ill. Taft, who weighed over 350 pounds, reassured Root by cabling that he was much better and that he had, in fact, just returned from a twenty-five-mile ride on horseback. Elihu Root cabled back. 'How is the horse?'

Former President Ulysses Simpson Grant's six-week visit to China in 1879 seemingly made little impression upon his hosts, though he was the most important American to have visited the country and he was borne in an imperial palanquin into the heart of Peking's Forbidden City. No mention of the visit appears in the daily records of the court. Grant — who had been chief commander of the Union Army in the U.S. Civil War — told the ruling regent of the Manchu Court that 'any course short of national humiliation or national destruction is better than war. War, especially in the East, would be a misfortune — a great misfortune.' Prince Kung responded: 'A great misfortune to the outside powers as well.'

The president of Korea apologized to Lyndon B Johnson when 'only' 2 million people were on hand to greet the visiting U S President. I m sorry, President Johnson,' the Korean chief declared, but this is all the people I have '

For all his charismatic authority President Lincoln could not inspire the American people with his vision of amortizing the abolition of slavery over forty years The President twice proposed a Constitutional amendment that would end the Civil War immediately and pay off slaveholders by 1900, at which time all slaves would be granted their freedom

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All U S Presidents have worn eyeglasses, although many of them — including Lincoln — didn't like to wear them in public.

In 1844, during his successful Presidential campaign, James K Polk was smeared with the charge that he had branded his initials on the shoulders of forty-three slaves

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The only professional scientist who became the head of a nation was the chemist Chaim Weizmann, who became president of Israel when it was founded in 1948 He remained President until his death in 1952

Bolivia was liberated from the rule of Spain in 1825 Between then and 1925, the nation had over forty presidents, six of whom were assassinated while still in office. Over the same one hundred years, Bolivia had 187 armed revolts Between 1828 and 1871, there were nine different constitutions

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During his successful come-from-behind Presidential election campaign in 1948 against the Republican front-runner, Thomas E Dewey, President Harry S Truman conducted a

thrity-five-day 31,000-mile 'whistlestop' campaign, delivering 356 speeches

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No President of the United States was an only child.

When the federal excise tax on whiskey enraged western Pennsylvanians so much that they initiated the Whiskey Rebellion of 1794, President George Washington as commander-in chief of the United States Army donned his Revolutionary War uniform, raised a force of 12,000 men, rode to Fort Cumberland, and stopped the rebellion cold

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PRESIDENTS' WIVES

American First Ladies not only far outlive their husbands but have a mortality rate 11 percent lower than the general population of women according to a Metropolitan Life Insurance survey. Presidents since 1841, even excluding those assassinated, have had a mortality rate 40 percent higher than their wives.

Andrew Carnegie personally paid pensions to widows of former Presidents before Congress decided that the responsibility was the country's and not a steel magnate's.

President Ulysses S. Grant's wife was cross-eyed and wanted to correct the problem. Grant refused to let her have the operation because he liked her that way.

When the First Lady, Eleanor Roosevelt, received an alarming number of letters threatening her life, soon after her husband, Franklin D. Roosevelt, took office as President of the United States during the Depression, the Secret Service insisted that she carry a pistol in her purse.

Abraham Lincoln's wife – like Lincoln himself – was born in Kentucky. During the Civil War, she was accused of being a spy for the South, for her brothers were members of the Confederate Army.

President Andrew Johnson's daughter, who ran White House domestic affairs in place of her invalid mother, bought two Jersey cows, which she kept on the White House grounds, to assure her family of fresh milk and butter.

President Calvin Coolidge did not allow his wife to supervise any details of White House life. He did it all. Even the menus and other housekeeping plans were submitted to him and not to the First Lady. She did not even buy her clothes without **Coolidge's approval.**

Martha Washington was nearly sixty years of age when she became 'Lady Washington,' as she was called during her husband's Presidency. She did not enjoy the role. She had not read widely, had slight interest in politics, and rarely made a public political comment. And she was a poor conversationalist. Privately, she wrote that she was 'more like a state prisoner than anything else.'

Two First Ladies practiced interesting economies by using the lawn of the White House. Mrs. William Howard Taft, as part of her penny pinching for the kitchen, bought a cow, which grazed on the White House lawn twice a day; milk from the cow was delivered to the White House kitchen. Mrs. Woodrow Wilson practiced stringent economies during World War I. Among her programs, she bought a flock of sheep to crop the White House lawn, and auctioned their wool for the benefit of the Red Cross. She was a good businesswoman - the auction netted $100,000.

Mary Todd Lincoln was tried for insanity before a jury after her husband's assassination. Her son Robert attempted to

have her declared legally incompetent when she began suffering hallucinations and phobias. She was granted a trial before a person could be institutionalized. Mrs. Lincoln attempted suicide after she was judged insane by the court and was taken to a sanitarium where she received treatment. She improved to the point that another court reversed the insanity verdict in 1876.

PROPHETS

Fourteen years before the *Titanic* sailed on an April day in 1912 on her maiden voyage from Southampton to New York, a novel was published called *Futility* about an unsinkable and glamorous Atlantic liner, the largest in the world. Like the *Titanic*, the fictional vessel was triple-screw and could make 24-25 knots, at 800 feet it was a little shorter than the *Titanic*, but at 70,000 tons its displacement was 4,000 tons greater. Like the *Titanic*'s, its passenger list was the creme de la creme, and of course there weren't enough lifeboats. On a cold April night, the fictional 'unsinkable' vessel strikes an iceberg and glides to the bottom of the Atlantic. The name of this liner, in the story by Morgan Robertson — The *Titan*

The American inventor Samuel Pierpont Langley (1834-1906), spent $50,000 of government money between 1897 and 1903 in an attempt to devise a workable airplane. His three attempts were all failures. After his third failure *The New York Times* published a severe editorial castigating what it considered Langley's foolish waste of public funds on an idle dream. There was nothing wrong, by the way, with Langley's last plane except an unsufficiently powerful engine. In 1914, that plane was fitted with a better engine and successfully flown.

Back about 340 B.C., Aristotle observed that dolphins gave birth to live young that were attached to their mothers by umbilical cords. For this reason, he considered dolphins and related creatures to be mammals. Biologists agreed with him – twenty-four centuries later.

In his speech accepting a Nobel Prize in chemistry - for his mass spectrograph and the knowledge it had given rise to - the English chemist and physicist Francis Aston envisaged a future in which the energy of the atom would be tapped by man, and he forecast the dangers involved in such an eventuality. But the year was 1922, and Aston's views were considered the province of science fiction writers.

The English chemist William Prout published an article in 1815 suggesting that all the chemical elements were built up out of hydrogen, the simplest of the elements. He realized this was a very far-out suggestion. To avoid scarring his reputation, he published his hypothesis anonymously. His authorship was discovered, however, and the notion was called 'Prout's hypothesis'. For exactly a hundred years, chemists 'proved' over and over again that Prout was wrong - until it was discovered that the elements were really mixtures of slightly different varieties of atoms. Each variety is built of particles like the one that makes up the nucleus of the hydrogen atom. In that sense, the truth proved to be very close to Prout's hypothesis.

More than three-quarters of a century before Freud published his first major works, Dr. Benjamin Rush, who established the first free dispensary in the United States, sowed the seeds of 'modern' psychoanalysis in his book *Diseases of the Mind*, in 1812.

Twenty-three centuries passed between the Greek philosopher Xenophanes' surmise that mountains on which seashells were found must originally have been covered by the sea and the Scottish geologist James Hutton's scientific deduction that made sober sense of what had seemed lunacy.

A completely automated grist mill was invented by the American Oliver Evans in 1793. The mill performed all

operations without human labor The millers, of course, opposed it, and it would be many decades before Evan's idea was fully accepted. In 1805, Evans suggested using the evaporation of ether for refrigeration, and again was decades ahead of his time.

While it was the deepest secret in the world, the atomic bomb was publicly described with considerable accuracy by Cleve Cartmill – a year and a half before it was announced officially. The description was included in a science-fiction story called 'Deadline,' in the March 1944 issue of *Astounding Science Fiction*, so virtually no one paid any attention

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Astronomers today have the very modern notion that the stars are suns and that they generally have planetary systems and that on some of them there may be life. A German archbishop, Nicholas of Cusa, said the same thing in 1450 A.D. – but almost no one listened.

Social Gospel, a nineteenth-century Protestant movement to apply principles of Christianity to social and economic problems of an industrial society, became a factor in the New Deal The Reverend Endicott Peabody, founder of the Groton School and an advocate of the social responsibilities of the wealthy and powerful, preached this message to his students – one of whom was Franklin D Roosevelt.

As early as 1868, Mahlon Loomis – experimenting with electricity – was able to carry on two-way conversations without wires over a distance of eighteen miles, between two mountains in Virginia But he was unable to find financial backing for exploitation of his device

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The true size of the Earth was known seventeen and a half centuries before it was first circumnavigated. In 230 B.C., the Greek philosopher Eratosthenes worked out its circumfer-

ence of 25,000 miles by studying shadows cast by the sun at different places on the same day

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The suggestion that a star could be so massive and have so strong a gravity that it would be invisible – that it would be in other words, a black hole, a notion that we accept today – was first made nearly two centuries ago, by the French astronomer and mathematician Pierre Simon, Marquis de La Place.

The first person we know who realized the Earth couldn't be flat was the Greek philosopher Anaximander. About 560 B.C., he suggested the Earth had a cylindrical shape. By 350 B.C., the concept of a spherical Earth was so satisfying and so free of paradox that it was generally accepted by scholars even in the absence of direct proof. Eighteen more centuries were to pass before direct proof occured – the lone surviving ship in an expedition once commanded by Ferdinand Magellan sailed completely around the globe.

The Roman poet Lucretius, in 56 B.C., published a poem in which he expounded the views of those Greek philosophers who believed the universe to be composed of atoms. All the works of the earlier atomists had vanished because their views were unpopular, and Lucretius' poem almost vanished, too. In 1417, however, one copy was discovered, copied, and eventually printed. Its views helped to persuade the chemists of early modern times to consider the atomic theory of matter, and those views won out eventually.

Among the first to suggest that clocks be moved ahead to extend daylight hours during the spring and summer was Benjamin Franklin. However, it was not until March 31st, 1918, more than a century after Franklin's death, that Congress adopted the practice – during World War I, in order to save electricity. During World War I, daylight saving

was also adopted in England, Germany France, and many other countries.

A chaplain of the U.S. Senate – Edward Everett Hale – was the first to propose the artificial satellite, in 1870, in *The Atlantic Monthly*, in a story called 'The Brick Moon.' Brick as a material for the satellite was selected because it might be able to withstand the heat of atmospheric friction. (Hale also wrote the classic short story 'The Man Without a Country.')

About 3650 B.C, an Emperor of China, Hwang Ti, noted that 'all the blood in the body is under the control of the heart. . . the blood current flows continuously in a circle and never stops.' More than 4,000 years were to pass before experimental data – William Harvey's, in 1616 – supported the theory that the heart functions as a pump and that blood circulates through the body.

Newton estimated correctly that the Earth would have a mass of 6,600,000,000,000,000,000,000, tons and a density of about five and a half times that of water. The fact wasn't demonstrated until one century after his estimate.

The first 'horseless carriage' to be run by an internal combustion engine was built by the Belgian-French inventor Etienne Lenoir, in 1860. It ran on illuminating gas. Lenoir also hitched a similar engine to a boat, and produced the first motorboat. The so-called Lenoir engine wasn't efficient enough, and the inventor died poor.

The first Greek to observe ocean tides, in the Atlantic in the early third century B.C., was the navigator and astronomer Pytheas, who also produced the correct explanation for them. He was 2,000 years ahead of his time, for it took that long for tides to be attributed (by Newton) properly to the influence of the moon. Until Newton's time, most scholars

refused to believe that the moon could have any effect on the ocean, especially because one tide each day took place when the moon was not even visible in the sky.

H G Wells wrote of an atomic weapon in 'The World Set Free' in 1914. His name for the device was 'atomic bomb'.

The U S and Great Britain were warned in February 1945 that if the German people surrendered to the rapidly approaching Russian army, the Russians would drop an iron curtain between their occupied lands and the West, remorselessly keeping away all non Soviet, or outside, influences. The exhorter was Joseph Goebbels whose chilling picture of Soviet domination was designed to persuade the Western Allies in the final days of the war. Many political leaders before Goebbels had used the phrase 'iron curtain' as well, but it took Winston Churchill to make it memorable. Ten months after the end of World War II, the former British Prime Minister addressed himself to the dangers he perceived, and one of the greatest he said was the 'iron curtain' that indeed had descended across the Continent, 'from Stettin in the Baltic to Trieste in the Adriatic', just as Goebbels had predicted. Churchill had originally used the phrase 'iron curtain' in May 1945, in a telegram to President Truman, but the telegram was then top-secret.

RELIGION

By insisting that the Puritans enforce their law against Quakers rather than accepting their terms for freedom, Mary Dyer of Newport, Rhode Island, was hanged on Boston Common on June 1, 1660, and became the only woman resident of the colonies in America to die for the cause of religious freedom. Mary was three times banished from the Colony of the Massachussets Bay for her beliefs, twice on pain of death should she return. On her third visit to Boston, she watched the hanging of two fellow Quakers, then was placed upon the gallows for her own execution. At the last moment, with the noose about her neck, she was reprieved, to be sent back to her home on the condition she did not return. But she was back in Boston the following May. She again was offered reprieve if she would remain outside the colony, and again she refused. This time she was hanged for her challenge of the law of banishment of Quakers.

A room with bath is perpetually reserved in one of Java's best hotels for the goddess of the South Sea, Njai Loro Kidul.

December 25 was not celebrated as the birthdate of Christ until the year 440 A.D.

Francis Asbury, the first U.S. Methodist Episcopal bishop, covered 270,000 frontier miles between 1771 and 1816, preaching to pioneers in the American West. He preached anywhere he could attract a crowd — at camp meetings, on riverboats, in bordello parlors, and from church pulpits.

A nation other than modern Israel was the first to adopt Judaism as a state religion. The pagan Khazars, a Turkish people who had migrated from Asia to southern Russia, established a kingdom on the Volga River and in the eighth century A.D. adopted Judaism. The monarchy was able to maintain an uneasy peace between Christians and Muslims. The kingdom was destroyed two centuries later by invading troops from Kiev.

In 1831, a persuasive religious enthusiast from New York, named William Miller began preaching that the world would come to an end on April 3, 1843. He and his followers were based on a thorough study of the Bible and he convinced thousands of Americans. When Judgment Day arrived, his followers gathered on hilltops and in churches and waited. Many had burned their possessions or given them away. When April 3 passed uneventfully, Miller named a new date, October 22, 1844. Many loyal followers met a year at that time. The Millerite movement then declined. Critics scoffed that on each supposed last day of the world Millerites would need **and pantry were full.**

Sticking to their belief that the Lord alone giveth and the Lord alone taketh away, the Mormons refused help from the U.S. government during the Depression of the 1930s. They were the only American farm cooperative so-called because the land, though owned by the Church, was worked by Church members to do so.

Many odd beliefs grew around the sacrament of the Mass in the medieval church. People believed that the Host, the consecrated wafer of the Eucharist, the bread used is pure white and unleavened and baked in small disks. Its magical powers, they would carry it secretly away from the church and use it to: cure sickness, put out fires, fertilize fields, make love charms, protect a criminal from discovery, and so on.

The practice was popular among average churchgoers in England, but more so – according to John Lake (1624-89,, bishop of Chichester – among 'witches sorcerers, charmers, enchanters, dreamers, soothsayers, necromancers, conjurers, cross-diggers, devil-raisers, miracle-doers, dog-leeches and bawds.'

In medieval times, church bells were often consecrated to ward off evil spirits Because thunderstorms were attributed to the work of demons, the bells would be rung in an attempt to stop the storms Lots of bellringers were killed by lightning.

Despite the fact that the church during the Renaissance frowned on the occult as bordering on heresy, Pope Julius II set the time of his coronation in 1503 according to astrological calculations.

Although Buddhism began and first flourished in India, it had by 1200 all but disappeared there, but had won huge numbers of followers in Ceylon, Burma, Thailand, Tibet, China, and Japan (Less than 1 percent of the 1977 estimated Indian population of 622,200,000 were Buddhists.)

Suspension of the construction of the Washington Monument, at the 153-foot level, was forced by the anti-Catholic Know-Nothing movement, which was offended by Pope Pius IX's gift of a block of marble from Rome's Temple of Concord. The suspension lasted twenty-six years Work resumed in 1880 and the monument was completed in 1888

Discrimination against Roman Catholics in citizenship and public life was legal somewhere in the United States until 1835, when the last anti-Catholic law of colonial times was repealed.

Ten years before Henry VIII broke with the Roman Catholic Church and established the Church of England over the issue of his divorce, he wrote a book entitled *Assertion of the Seven Sacraments*, which attacked Martin Luther's theses and affirmed his loyalty to the pope. The pope granted Henry the title Defender of the Faith for having written this scholastic work. The king kept the title after breaking away from Catholicism – as have his successors to this very day.

Missionary diplomacy – the influence in foreign countries of U.S. missionaries and their supporters – had strong and sometimes violent effects. Protestant missionaries in Hawaii were strong influences for annexation of the island to the U.S. In China, Protestant and Catholic missionaries caused U.S. troops to be involved in suppressing the Chinese Boxer Rebellion, in 1900. Protestant efforts to overturn the rule of Catholic Spain in Cuba were a contributing factor to the Spanish-American War.

A visitor in 1946 to the Greek Orthodox monastery of St. Catherine's, founded in the sixth century at the foot of Mount Sinai (Jabal Musa in Arabic), learned that the monks there did not know of World War II and that some had not heard of World War I.

Jesus of Nazareth was born four to eight years before he was 'born'. His birth was in the reign of Herod, who died in 4 B.C., four years 'Before Christ'. In 534 A.D., the first man who calculated the year of Jesus' birth made a mistake – and we've been stuck with it ever since.

The Chinese Emperor Kublai Khan, a clever politician, observed not only the holy days of his nation, but those of the three major faiths of the West – Christmas and Easter for the

Christians, Passover and the Day of Atonement for the Jews, and Ramadan for the Muslims.

In the sixteenth century, many Christians gave up the Catholic faith and became Protestants. The rejection of the lavish ritual of Catholicism often took extreme forms. In England, elaborate ceremonies and processions were banned to keep religion pure. Later, in 1647, a law was passed by Parliament that abolished Christmas and stated that it was to be a day like any other day. Some people felt, however, that this law went too far. Sometimes, entire congregations were arrested for protesting the abolishment of Christmas.

Mithraism, one of the dominant religions of the Roman Empire, was practiced more than Christianity in the second century A.D. Named for the ancient god Mithras of Iran, who was originally a minor figure of Zoroastrianism, Mithraism became essentially a soldier's religion. Its ethics were rigorous, loyalty was inculcated, and fasting and continence were prescribed. It was a mystery faith. Converts entered by rites that involved bathing in the blood of a freshly killed bull. Mithraism became far more popular and important in Rome that it possibly could become in Persia under the hostile eyes of the orthodox Zoroastrian priesthood.

In early eighteenth-century Portugal, the Church owned two-thirds of all the land.

A woodsman's ax was the only implement used to shape the twenty-two silvery-scaled onion domes of the wooden Church of the Transfiguration at Kizhi, Russia. It is located on an island in Lake Onega near Leningrad.

Nearly four centuries before Columbus's first voyage across the Great Ocean Sea, the first bishop of America was appointed. Named by Pope Paschal II, Eric Gnupsson had in his province Greenland and Vinland (America).

In biblical days, it was forbidden to sell a synagogue for subsequent use as a tannery, bathhouse, immersion pool, or urinal. The institution of the synagogue probably dates to the Babylonian exile of the sixth century B.C. The returnees to Jerusalem brought with them the basic structure that was to develop by the first century A.D. into the well-defined institution known from then to this day.

When a statue of native-born Copernicus was unveiled, finally, in 1839, in Warsaw, no Catholic priest would officiate at the occasion through the world-shaking astronomer had been a canon of a cathedral in East Prussia and had in 1543 dedicated to Pope Paul III his revolutionary treatise on the way the universe really works.

St. Mary-Magdalen dei Pazzi (1566-1607), the Florentine mystic and Carmelite nun, preached so volubly during her ecstasies that she had to be provided with six secretaries, who wrote under her dictation for hours and sometimes for whole days at a time.

Queen Mary, in 1555, banned any version of the Bible in English translation, commanding 'that no manner of persons presume to bring into this realm any manuscripts, books, papers, etc., in the name of Martin Luther, John Calvin, Miles Coverdale, Erasmus, Tyndale, etc., or any like books containing false doctrines against the Catholic faith.'

After St. Francis's death in 1226, his followers who attempted to continue to embrace a life of poverty were burned at the

stake as heretics. The Church had no desire to encourage poverty because it had become committed to the financial power structure of Europe.

The Egyptians attacked the Jews on a holy day in 320 B.C. An army led by Ptolemy I of Egypt attacked Jerusalem on the Sabbath. But unlike the Israelis in 1973, the ultra-pious Jews in those days refused to fight on the Sabbath, even in self-defense, and so Jerusalem – which had withstood Sennacherib and Nebuchadnezzar with admirable tenacity – fell easily to Ptolemy.

By 'deciphering' the Book of Revelations, a minister in Lochau – in what is now East Germany – proclaimed that the world would end on October 18, 1533. When it didn't happen, the minister – a Michael Stiftel – was given a thrashing by the townspeople.

No other country has as diverse religious groups as the U.S., which has at least 52 major denominations with membership exceeding 100,000. The *Yearbook of American and Canadian Churches* lists 223 sects, cults, and denominations, not counting groups such as the First Church of Christ, Scientist, which provide no membership statistics.

Piles of skulls of dead Greek Orthodox monks are stacked in St. Catherine's monastery near the foot of Jabal Musa, the traditional Mount Sinai (at the mouth of the Gulf of Aqaba), the holy site revered as the place where God spoke to Moses from the Burning Bush. Christian monks since about 250 A.D. have lived and prayed at St. Catherine's, and it is their wish even today to have their own heads added to the piles.

A Baptist church in Hammond, Indiana, reported a record attendance of 12,350 worshippers in December 1972. The

church employed a fleet of sixty-eight buses picking up people over a radius of fifty miles. The advertised program for Heaven Sunday included Carl McIntire, and an organist without arms or legs, a karate expert, a former Hollywood stunt cowboy, an ex-football hero, a rodeo star, Santa Claus, and a ventriloquist.

The great British physicist Robert Boyle (1627–91), who was the first to study gases scientifically, was a fairly religious youth who became even more devout the rest of his life after being frightened by a thunderstorm in Geneva. In middle age, he learned Hebrew and Aramaic. He wrote essays on religion and financed missionary work in the Orient. In 1680, he was elected president of the Royal Society but would not accept because he disapproved of the form of the oath. Through his will, he founded the Boyle Lectures, not on science but on the defense of Christianity against unbelievers.

No clergyman attended the U.S. Constitutional Convention, and the Constitution itself contains no religious references, not even a mention of God. The founding fathers even added these strong words in the Bill of Rights two years later: 'Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.'

In 963 A.D., Athanasius established the famous monastery on the sharp peak of Mount Athos in northeastern Greece. Though the monastery is dedicated to the Virgin Mary, no woman has ever been allowed on the mountain.

A chief tenet of John Humphrey Noyes's utopianism held that the pleasures of sex and the bearing of children were events that might be separated in the interests of his community, which was called Oneida and located in New York State. Withholding of male orgasm would satisfy the tenet. Older women of Oneida initiated boys into the art of

coitus reservatus and older men instructed the young women. Carefully chosen couples were permitted to have children, who then were raised by the community instead of by the parents, in the manner proposed by Plato. This religious society of 'perfectionists' was established in 1848. It prospered economically by making steel traps and silverware. It was reorganized in 1881 as a joint stock company and the social experiments were abandoned.

Thomas Aquinas was kidnapped by his own family. After an education at Monte Cassino and at the University of Naples, Thomas joined the new Dominican order in 1244. His family objected, kidnapped him, and held him in custody. He escaped, and made his way to Paris. His philosophical system remains the basis of Catholic teaching to this day. By upholding reason as a respected method of extending the boundaries of human knowledge, he helped to make science respectable again in Christian Europe after it had been considered pagan for a long period. He was canonized in 1323, a mere half-century after his death.

Various gatherings of bishops in southern France in 990 A.D. tried to set up a 'Truce of God,' a subjection of warfare to rules. The chief rule called for converting all ecclesiastical property and persons into a kind of neutral territory that was not to be touched. Eventually, this was extended to a total prohibition of warfare from Wednesday evening to Monday morning of each week, and on numerous fast and feast days as well. In the end, as much as three-fourths of the year was put off limits to fighting – in theory.

The Society of Jesus has never officially adopted the term 'Jesuit,' and the popes in their official documents about the society have never used the term. In an unofficial way, however, members of the Society refer to themselves as **Jesuits.**

The Jews and the early Christians started the day at sunset. "Christmas Eve" means, accordingly, the first part of Christmas Day, and it was only later that it came to be considered as the evening *before* Christmas. The same goes for New Year's Eve.

Michael Faraday (1791–1867), the great English chemist and physicist, was a member of the Sandamanian Church, a tiny sect of fundamentalists. He was invited to dinner with Queen Victoria on a Sunday in 1844, which meant he would have to miss services. After an agonizing period of uncertainty, he decided it was necessary for him to obey the Queen. His fellow church members excommunicated Faraday as a result, and would not reinstate him until he had undergone considerable penance.

The Shakers, a Utopian religious group that was at its height in the late eighteenth and early nineteenth centuries, were nearly self-sufficient and quite innovative. Living in rural communes concentrated mostly in the northeastern U.S., they made their own shoes, silk, and clothes. They invented the circular saw, the common clothespin, an apple parer, the first one-horse buggy, a four-wheeled dumpcart, a rotary harrow, the automatic spring, a washing machine that later was used by hotels, and the needle with an eye in the middle that later was adapted to the sewing machine.

In a single century, from 1170 to 1270, the French working classes built some 80 cathedrals and 500 large cathedral-type churches. Notre Dame in Paris, the first great Gothic cathedral, was built by an effort of the entire community. Inspired by Christian faith, manual laborers, master artists, serfs, merchants, and princes worked from 1163 to 1300 to complete this cathedral.

In a church in Czechoslovakia, there is a chandelier made of human bones. The ceiling is festooned with the remains of former worshippers.

During the high Middle Ages, there was, on the average, a church for every 200 people. The area covered by religious buildings took up a large part of every city. In the English cities of Norwich, Lincoln, and York, which had populations of between 5,000 and 10,000, there were fifty, forty-nine, and forty-one churches, respectively.

The story of Noah's Ark was written earlier than the biblical version – in the Sumerian *Epic of Gilgamesh*. The 'Noah' of this epic is Utnapishtim, who is supernaturally warned to build a boat in which to survive the deluge. Similarity extends even to the sending out of birds to see if dry land has appeared.

Provided they agreed to look after their own poor, Jews were to be welcomed in New York by the stern and narrow-minded Dutch governor Peter Stuyvesant, on orders from the Dutch West India Company.

Pope John XXIII served as a sergeant in the Italian army during World War I.

Muslims are forbidden to drink liquor. Saudi Arabia's prohibition law requires that foreigners' liquor cabinets, when not in use, must be sealed. Violation by two Britishers in 1978 led to 200 strokes with a cane and a ten-month prison sentence.

While there is no law that forbids the mentioning in Swiss

newspapers of suicide as a cause of death, suicides are not specifically mentioned in many cases. The reason for such omissions is related particularly to Catholic doctrine that regards suicide as sinful.

Lionel Nathan Rothschild (1808-79), of the prominent family of European bankers, became in 1847 the first Jewish member of the British House of Commons, but he did not assume his seat for eleven years, until Parliament finally let him take the oath in a manner acceptable to his Jewish faith.

SALTY FACTS

The first systematic chart ever made of an ocean current was published by Benjamin Franklin in 1769. Franklin was aware that American ships took two weeks less to cross the Atlantic Ocean than did British ships. He learned that when traveling to Europe Americans steered to take advantage of the eastward current, and that on the return journey they attempted to avoid the current. Using temperature measurements and observation of changes in water color, Franklin had a chart drawn that showed the course of the great current, which he named 'Gulf Stream.' British captains ignored the chart of this 'river in the ocean' for many years, but Americans found it valuable.

You cannot easily drown in the Dead Sea or in the Great Salt Lake. Because of salinity, the water is so buoyant that it is difficult to even get under the surface.

Salt has never turned up in a primitive rock formation. All salt deposits are of aqueous origin. All of the 350,000 cubic miles of salt deposited in the earth is sea salt - that is, it all came from the sea in the past.

Each year, 9 million tons of salt, more than 10 percent of all the salt produced in the world, is applied to American highways for road de-icing. The cost of buying and applying the salt adds up to $200 million.

So visibly polluted with globules of unknown composition had the mid-Atlantic Ocean become that Thor Heyerdahl

and his crew drifting across the ocean in 1971 were reluctant to dip their toothbrushes in the water.

Captain William Bligh (1754–1817), who became well known as the victim of his crew's mutiny on the ship *Bounty*, was the victim of another rebellion. In 1808, when governor of Australia, Bligh tried to eliminate rum smuggling. A 'Rum Rebellion' occurred and officers of the New South Wales Corps arrested Bligh, took over the government and held him prisoner until a new governor arrived the following year.

Every cubic mile of seawater holds over 150 million tons of minerals. There are 350 million cubic miles of seawater on the planet.

The oceans of the world are so vast and deep that if Earth had an absolutely level crust, the sea would form an envelope over 8,800 feet deep.

Salt helped build the Erie Canal. A tax of 12½ percent on New York State salt, plus tolls charged for salt shipments, paid for nearly half of the $7 million construction cost.

The English naval hero Viscount Horatio Nelson chose to be buried in St. Paul's Church in London rather than in the national shrine of Westminster Abbey because he had heard that Westminster was sinking into the Thames.

There is a salt mine in the Polish town of Wieliczka, near Cracow, that has been in operation for nearly 1,000 years.

In the mid-seventeenth century, Polynesians built double-hulled canoes, carried by sails made from woven coconut fibers, that could sail more than 1,000 miles in all kinds of weather. The wooden hulls, sometimes eighty feet long, were

lashed together and a deck house built between them.

Joshua Slocum was the first person to sail around the world alone. When he was fifty-one years old, he left Newport, Rhode Island, in 1895, in his thirty-six foot oyster boat *Spray*, returning three years and two months later after sailing 40,000 miles.

Two men rowed across the Atlantic in 1896. George Harbo and Frank Samuelson set out from New York in an open boat, took turns at the oars, and reached Britain's Scilly Isles. They were fifty-five days at sea and covered 3,000 miles. (Provisions included canned meat, 250 eggs, a hundred pounds of sea biscuits, nine pounds of coffee, and two tanks of fresh water. The adventurers also had a small stove and five gallons of kerosene for its operation.)

SHARPS AND FLATS

In addition to the use of the British national anthem, 'God Save the Queen,' in Britain and other Commonwealth countries, the anonymously written tune itself has been used for a patriotic song or national anthem in other countries (including, in the past, Germany, Russia, and Sweden and currently, the United States, Switzerland, and Liechtenstein). In total, it has been used by about 140 composers (including Haydn, Beethoven, Weber, and Brahms).

When Girolamo Frescobaldi, (1583-1643), the great keyboard virtuoso, was appointed organist at St. Peter's in Rome, in 1608, 30,000 flocked to his first performance there.

New York's original Metropolitan Opera House was started because of a feud between the Astors and the Vanderbilts. In 1870, the Astor-dominated Academy of Music Opera House refused William Henry Vanderbilt's offer of $30,000 for a box for the season. He retaliated by forming a syndicate to build what was to become America's most important and influential opera theater.

Because the middle finger on each hand was considered too short, Ignace Jan Paderewski, the famous Polish pianist, composer, and statesman, was told by a teacher that he could never expect to be a competent pianist.

Before the mechanical clock was invented in the fourteenth century, the most complex machine was the pipe organ.

installed, about 950 A D , by Bishop Aelfeg in his cathedral in Winchester, England The organ had 400 pipes, and seventy men were needed to operate the twenty six bellows

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If a deaf person understands the physics of sound, he or she can tune a lute, a viol, a spinet, or any stringed instrument The sound made by a vibrating string depends on its length, its mass, and how much it is stretched

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Ironically, one of the Confederacy's rallying songs in the U S. Civil War, 'Dixie,' was written by a Northerner, Dan Emmett, of Ohio.

The French horn is a descendant of the medieval hunting horn, which was shaped into a loop so that it could more easily be carried and played on horseback. The tube of the modern horn is from twelve to sixteen feet long. Before the introduction of its three valves, the horn could produce only a limited number of tones In order to get different tones, players had to remove part of the tube and replace it with a larger or smaller one, these parts being called 'crooks.' Players were expected to carry nine of them, allowing them to play a complete range of keys.

At the age of two, William Schwenck Gilbert was kidnapped from his parents in Naples, Italy, and ransomed for £25 He wrote kidnapping episodes in two of his operettas with Arthur Sullivan – *The Gondoliers* and *The Pirates of Penzance*

Irving Berlin, America's most prolific songwriter, has never learned to read music or to write it He hums or sings his songs to a secretary, who takes them down in musical notation.

Many composers have written 'musical puzzles,' com-

positions that were amusing to them, if not to their listeners who probably did not recognize them as such. Haydn's Piano Sonata in A, for example, contains a movement in reverse, in which the second part is exactly the same as the first, but played in reverse. Similarly, in one section of Arnold Schoenberg's *Pierrot Lunaire*, the music goes forward to a midway point and then works its way exactly backward. Paul Hindemith has gone them one better. In *Ludus Tonalis*, the Postlude is, with the addition of a final chord, the same as the Prelude, but the score is played upside down and backward.

Gioacchino Rossini – perhaps rid-culing composers who would excuse their lack of creativity because of the lack of suitable subjects – declared: 'Give me a laundry list and I'll set it to music.'

There were at least fifty-two musicians in the family of Johann Sebastian Bach.

Beethoven was half-deaf most of his life. He was completely deaf when he composed his greatest work, the Ninth Symphony.

Much of operatic star Enrico Caruso's fame came from his recordings, a new industry when he first began. In 1902 he recorded ten songs for the Gramophone and Typewriter Company, for which he was paid £1,000, a fee considered exorbitant by the recording company. Later, they were very glad they had made the deal, their net profit amounted to about £15,000.

When Charles Ives's *Concord* Sonata and Fourth Symphony are performed a specially sized block of wood is used by the pianist for striking complex chords correctly.

So shy was Franz Peter Schubert that his first meeting with Ludwig van Beethoven was his last. Schubert had written a set of variations on a French tune for four hands and dedicated it to Beethoven, to whom he wanted to present the score personally. A meeting was arranged. Because he was deaf, Beethoven handed a piece of paper and pencil to Schubert so that a particular bar of music could be explained. Schubert became so nervous at the request that he fled from Beethoven's home and the two composers never again met.

Mozart composed, wrote down, rehearsed, and performed within five days his *Linz* Symphony, the Symphony in C Major, K.425.

The great tenor Enrico Caruso was performing in San Francisco on April 17, 1906, when the famous earthquake occurred. The terrified tenor took just one thing from his shattered room, a picture of President Theodore Roosevelt, personally autographed to Caruso. Later, when he tried to get on a train with the other members of the opera company, the guards didn't recognize him and wouldn't let him pass. But Caruso showed them his treasured picture, was issued a boarding pass, and made his way to safety.

The original hurdy-gurdy was one of the most popular musical instruments of the medieval period. Known as the organistrum, it was a stringed instrument with a resined wheel that, turned by means of a crank, rubbed across the strings. Haydn wrote five concertos and several nocturnes for latter-day hurdy-gurdies, which combined these features with those of a small organ. These works were written for the king of Naples, who fancied himself a virtuoso on the instrument.

Francis Scott Key wrote 'The Star-Spangled Banner' to be sung to the tune of a popular English drinking song, the 'Anacreontick Song' or 'Anacreon in Heaven' which had been composed by John Stafford Smith for the Anacreontic Society of London. Anacreontics wrote poems in the style of the Greek lyric poet Anacreon (ca 521 B.C.). Percy Scholes's *Oxford Companion to Music* notes that 'the nation defied has furnished the music for the defiance – a proceeding happily unresented by either party.'

Both Arturo Toscanini and Leonard Bernstein got their big opportunities as conductors when they were called upon to substitute. Toscanini, a cellist at the time, took the podium at the opera house in Rio de Janeiro and conducted Verdi's *Aida* from memory. Bernstein substituted for an ailing Bruno Walter in Carnegie Hall, and his performance as conductor made the front page of newspapers in New York the next morning. He had been, under Walter, an assistant conductor of the New York Philharmonic.

Serge Diaghilev and Igor Stravinsky both studied law in St. Petersburg. Diaghilev hoped to become a composer, but was advised against it by Nicholas Rimsky-Korsakov. He instead became the father of modern ballet. Rimsky-Korsakov encouraged Stravinsky's musical interests, and Stravinsky became the father of modern music.

For $500, Stephen Foster sold to the leader of the Christy Minstrels the right to claim authorship of the song 'Old Folks at Home,' one of the most popular songs ever written. Christy held the right for a quarter of a century.

Bach's Six Concertos for Orchestra – the *Brandenburg* Concertos – were written for the margrave of Brandenburg, a prince who loved music, concertos in particular. When the margrave died, the *Brandenburg* Concertos were said to be

worth twenty-four groschen. Eight groschen were worth $1.50 in those days (1721), so the value for six of the most distinguished pieces in all of music was only $4.50.

Francis Scott Key wrote many other songs. Many were on religious themes, for he was a devout lay reader in the Episcopal Church. Still being sung is his hymn 'Lord with Glowing Heart I'd Praise Thee.'

At the pinnacle of his concert career the renowned pianist and composer Ignace Jan Paderewski (1860-1941) headed the Polish government, in 1919. He also headed the Polish government in exile during the early years of World War II.

More of Mozart's compositions are still in active use today than the works of any other composer in history - with the possible exception of J. S. Bach. But some of Mozart's most important works - by today's standards - have suffered long periods of neglect. For example, for twenty-three years, beginning in 1917, the Metropolitan Opera did not give a single performance of *The Marriage of Figaro*.

Nicolò Paganini (1782-1840) had a twisted stance on the concert stage, a spectacular technique, and an awesome mastery of the fingerboard that may all have been attributable, at least in part, to an affliction that he had inherited. It is believed that he exhibited the effects of Marfan's syndrome (named after the French pediatrician Bernard-Jean Antonin Marfan), which is characterized by a tall, thin body with underdeveloped muscles but with unusually long extremities and hypermobile joints. These enabled him to perform musical feats beyond the capacities of ordinary men.

Irving Berlin, one of America's great songwriters, taught

himself to play the piano by practicing on a piano in a saloon where he worked as a singing waiter. He could play only in one key, the key of F-sharp.

Maurice Ravel (1875-1937), one of the greatest of modern French composers, referred to his most famous work, *Bolero* as 'seventeen minutes of orchestra without any music.' He limited himself to an eight-measure theme that he repeated, with different orchestral colors, for the entire piece.

Only one person walked with Mozart's coffin from the church to the cemetery for its burial in an unmarked pauper's grave.

One of the earliest operas was composed by a woman, Francesca Caccini. Performed on February 2, 1625, in Florence, Italy, in honor of a visit by the Polish Prince Sigismund to the Medici court, it was a gala spectacle that wound up in a *balletto a cavallo*, a ballet performed on horses.

Though he could have used the money – 2,000 livres was 'a considerable sum, I admit' – Mozart declined the post of organist at Versailles, in 1778. One reason: He did not like French music.

A musician signed the Declaration of Independence. He was Francis Hopkinson, generally thought to be the first native-born American composer. His *Temple of Minerva* (1781), an 'oratorical entertainment' resembling opera in style, won the approval of most of his contemporaries, including George Washington.

It has been estimated that the songs of composer Irving Berlin are worth more than $100 million. His song 'White Christmas' has sold 113,067,354 records and 5,588,845 copies of sheet music in the United States and Canada alone, as of

May 1978. He has composed some 3,000 songs, publishing nearly 1,000.

To make their parades more glamorous, the Sybarites taught their horses to dance rhythmically to music. But when the Sybarite cavalry charged Croton, a city seventy miles to the south of Sybaris in Italy on the Gulf of Taranto, in 510 B.C., the men of Croton struck up a lively dance on their pipes and the Sybarite horses promptly fell to dancing. The charge was broken up, and the demoralized Sybarite army was slaughtered.

Beethoven composed his Third or *Eroica* Symphony in honor of Napoleon whom he admired. When Napoleon proclaimed himself emperor, an enraged Beethoven tore out the dedication to Napoleon and substituted 'To the Memory of a Great Man.'

The celebrated Budapest Quartet played an 'unforgettable' work at a concert in New York honoring the memory of Bela Bartok (who had died on Central Park West). It was unforgettable, remembers the critic-composer Robert Evett, 'because in the last movement of the Bartok *First Quartet*, which is a long one, someone got lost and stayed lost for at least ten full minutes, during which interval the music played was not the *First Quartet*, but some chaotic nightmare created for the occasion and surely impossible to duplicate. When the players got organized sufficiently to finish the piece more or less together they were received not with boos and catcalls but with a prolonged standing ovation complete with cheers and bravos.'

Only once, and in the right hand, is a white key played in Frederic Chopin's Etude for Piano in G-flat Major, Opus 10 No. 5, called appropriately - and what else! - the *Black Key Etude*.

During its first performance, on Christmas Eve 1818, in an Austrian village church at Oberndorf, 'Silent Night' was performed by [illegible] who were [illegible] as the organ bellows of the church having been gnawed away by mice.

'The Star-Spangled Banner' bore another name when it was first published in September 1814 in the Baltimore *Patriot*. It was called 'The Defence of Fort McHenry'. The title was changed about a month later.

The Russian composer Sergei Prokofiev composed an opera, *The Giant*, when he was only seven years old – using only the white keys.

As a young man Arturo Toscanini ran for political office in Italy – as a candidate of the Fascist Party.

Irving Berlin wrote his patriotic masterpiece, 'God Bless America,' for the Ziegfeld Follies. But after finishing it, he withdrew the song because he decided it didn't belong in a lavish girl show. It was not publicly performed until twenty years later, when Kate Smith introduced it, on radio, on Armistice Day 1938.

Mozart's librettist sailed to America and became a grocer in Philadelphia. Lorenzo Da Ponte, who had written for Mozart *The Marriage of Figaro*, *Così fan tutte*, *Don Giovanni*, was up to his ears in debt when he left Europe in 1808. After then failing as a grocer, he went to New York and in 1830 became professor of Italian at Columbia University.

Though he dreaded seasickness, the Viennese waltz king Johann Strauss agreed – after receiving, in advance, a payment of $100,000 in gold – to sail to Boston and conduct

there, in 1872, a supermusical called the World Peace Jubilee. The concert took place in a shed for 100,000 patrons. Strauss had to lead 20,000 musicians and choristers; to start everyone on time and to have them end all together, Strauss gave his beat to 100 subconductors.

Although 'The Star-Spangled Banner' was written by Francis Scott Key during the War of 1812, it was not adopted as the national anthem of the United States for more than a century, until 1931.

For thirteen years, Peter Ilich Tchaikovsky was financed by a wealthy widow, who stipulated they never met. And they didn't.

Beethoven as a child made such a poor impression on his music teachers that he was pronounced hopeless as a composer. Even Haydn, who taught him harmony for a time, did not recognize Beethoven's potential genius.

Although the song 'Auld Lang Syne' is usually attributed to Robert Burns, it was known at least a century before he published it in 1796. One of his letters says, 'It is the old song of the olden times, which has never been in print .. I took it down from an old man's singing.'

During the Renaissance, music for the Mass was originally based on a Gregorian chant, around which complex melodies were woven. But later, composers introduced popular tunes of the day, including two titled 'Good-bye, Lover' and 'Kiss Me'. They got away with it by changing the rhythms of the tunes, covering them with so many other melodies that the songs were not recognized.

Johann Sebastian Bach must have liked to walk. He walked

the 230 miles from Arnstadt to Lubeck, Germany, in order to hear the organist Buxtehude. On arriving [illegible] walked 25 miles to Hademarschen, [illegible] Handel had left the town [illegible]

Both Scarlatti and Chopin were inspired by cats. When Scarlatti's cat struck certain notes on the keys of his harpsichord one by one, with its paws, Scarlatti proceeded to write 'The Cat Fugue,' a fugue for harpsichord in D minor. While Chopin was composing [illegible] major his cat ran across the keys of the piano, [illegible] so much that he tried for the same sound in what is called 'The Cat's Waltz.'

The French composer Maurice Ravel suffered [illegible] to the brain in an automobile accident. He died in 1937 as a result of a cerebral operation, which it feared could not help him but hoped [illegible]

If we divide electromagnetic radiation into octaves (as we divide the sound waves produced by a piano), we are able to detect eighty-one octaves. Of these, the best known electromagnetic radiation, visible light, makes up [illegible] one octave.

Mozart comes closest of all musicians to being the universal composer. During his short lifetime, he died at thirty-five, he wrote operas and symphonies, chamber music and church music, solo and concert works for virtually every instrument – plus mechanical clocks and musical glasses. Ludwig von Köchel made a thematic catalog of Mozart's works and published it in 1862. Mozart's works are usually identified by their numbers in this listing – for example, the Piano Concerto in B-Flat, K595. The Köchel [illegible] catalogue 626 authentic works.)

The composer John Cage's *Imaginary Landscape No 4* (1953), never sounds the same way twice It is scored for twelve radios tuned at random.

SKY WATCHERS

The telescope was invented in 1608 when a young apprentice was playing games. While his master, the spectacles maker Hans Lippershey, was away, the apprentice amused himself with lenses and suddenly found a combination that made things seem closer. He showed this to Lippershey, who enclosed the lenses at two ends of a tube.

The speed of rotation of the Earth's surface increases steadily from zero at the poles to a bit over 1,000 miles an hour at the equator. New York City's latitude travels only about 790 miles per hour.)

Perhaps the astronomer with the sharpest eyes was the American E. E. Barnard. In the 1890s, he thought he detected craters on Mars, but he didn't announce this formally. He didn't think anyone else would see them and he feared he'd be laughed at. But he was one hundred percent right. It took seventy years and the development of rocket-powered Mars probes to demonstrate the fact.

Astronomers at first tried to compensate for poor lenses by making very long telescopes and sometimes by using lenses suspended in air without a tube. In 1722, James Bradley used a telescope 212 feet long. In the preceding century, the French astronomer Adrien Auzout had considered building one 1,000 feet long. He thought it might enable him to magnify things so greatly he would see animals on the moon.

On October 2, 1933, the light of the moon was received through Galileo's 3½-centuries old original telescope and was used to switch on the lights of the Century of Progress Exposition in Chicago. Photoelectric devices transformed the moonlight into electricity and the resulting current closed the illumination circuit of the exhibition.

Radio telescopes are now more important than ordinary light telescopes. The first was built inadvertently by an engineer K. G. Jansky, employed by Bell Telephone to locate the source of static on telephones. By accident, in 1931, he detected radio waves from space. The second radio telescope was built in 1938 by an amateur, Grote Reber, in his backyard in Wheaton, Illinois. It was not until after World War II that professional astronomers began to take radio telescopes seriously.

Astronomers classify stars by their spectra, to which they have given letter designations. It turned out that to put the stars in order of decreasing temperature, the spectra would have to be listed as O, B, A, F, G, K, M, R, N, and S. To make it easier to remember the order, a mnemonic device was created. 'Oh, Be A Fine Girl; Kiss Me Right Now, Sweetheart.'

An Irish amateur astronomer, the Earl of Rosse, built a telescope with a lens six feet across in 1845. It was called the Leviathan and was the largest telescope built to that time. But he built it in Ireland and the weather there was so bad he could hardly ever use it.

The German optician Joseph von Fraunhofer built magnificent refracting telescopes in the early 1800s. He discovered dark lines in the solar spectrum, founding the important

science of spectroscopy. He made important studies on light refraction and was a [illegible] before. But he didn't have a university education, and Fraunhofer was not allowed to address scientific meetings.

In the 1580s, the Danish astronomer Tycho Brahe built the best astronomical observatory and made the best astronomical instruments the world had seen. They included astrolabes and other devices for measuring the distance between two close stars. No one could possibly have done better. But just twenty years later the telescope was invented and Brahe's beautiful instruments were never used again.

Through the largest telescope on Earth and in the most favourable circumstances, it would not be possible to see an object on the moon much smaller than half a mile across.

During World War II, it was possible to get the best look yet at the Andromeda galaxy. The reason: Los Angeles was blacked out at the time, making it possible for the hundred-inch Mt. Wilson telescope near L.A. to be employed to maximum advantage through the fully darkened skies.

The English astronomer James Bradley, whose measurement of the diameter of Jupiter led astronomers to realize just how much larger some of the planets were than Earth, for so long regarded as the massive center of the universe, is supposed to have turned down a salary increase after he had become an astronomer royal in 1742. He observed that, if the position of astronomer royal were made too lucrative, no astronomers would be appointed to it - only politicians or noblemen.

On every sunny day for seventeen years, the German astronomer Heinrich Samuel Schwabe sketched sunspots.

His patience was rewarded in 1843 when he was able to announce that the sunspots waxed and waned in number according to a multiyear cycle He was only a year off, the cycle being eleven years rather than the ten that Schwabe had stated.

In 1800, a group of German astronomers, suspecting the existence of a small planet in an orbit between Mars and Jupiter, carefully parceled out the sky and arranged which astronomer should look where While they were organizing themselves carefully, an Italian astronomer, Guiseppe Piazzi, found the 'planet,' Ceres, quite by accident, on January 1, 1801 - the first day of the nineteenth century It was the earliest known asteroid The German astronomers kept looking away, and by 1807 found three more asteroids Pallas, Vesta, and Juno. (Since then, 1,700 more asteroids have been discovered.)

The English astronomer Jeremiah Horrocks was a curate He calculated the date for the next transit of Venus across the sun, and it turned out to be November 24, 1639, which fell on a Sunday. He got through the services with extraordinary speed, then raced across the fields to his instruments There was a happy ending! He got there in time to make the observation.

In the early 1400s, the greatest astronomer in the World was a Mongol prince, the grandson of the conqueror Tamerlane The prince's name was Ulugh Beg In 1428, he built an observatory in Samarkand, and later prepared a star map and planetary tables that were the best up to that time. No one heard of him in Europe, however By the time his work was translated into Latin, in 1665, the telescope had been invented and Ulugh Beg's work no longer had value

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The French astronomer Charles Messier (1716–1817) was interested in finding comets. He compiled a list of fixed objects that could be confused with comets. The list contained 103 objects. In the course of time, more and more objects were added to avoid. The objects on Messier's list are what we now call nebulae, for they are much more important than comets. Messier 13 is the great Hercules Cluster of stars. Messier 31 is the great Andromeda galaxy, which is a huge system of stars. Messier did, however, discover nine comets, none of them of any importance.

Maria Mitchell (1818–89) discovered a new comet in 1847. This brought her world fame and election as the first woman member of the American Academy of Arts and Sciences in 1848. Taught astronomy by her father, she discovered the comet while she was a librarian in Nantucket. In 1865, she was made Vassar College's first professor of astronomy, a post she held until 1888.

Tycho Brahe sat beneath the dais of a nobleman who began to write books. But he later became so vain that he was ashamed of it and published the fifty-two page work 'De nova stella' ('Concerning the New Star'). The greatest naked-eye astronomer, Brahe wrote in 1572 about the flaring-out of a star that had exploded and increased enormously in brightness. Its explosion created a supernova. 'Tycho's star' remained visible for a year and a half, growing brighter than Venus before fading out. Brahe's book strikes a blow to the Aristotelian notion that the heavens were perfect and unchanging.

The bibliography of variable stars at last includes about 200 000 references, and the catalog of some 3 000 stellar spectra by the Harvard astronomer Annie Jump Cannon were described

by Harlow Shapley, longtime director of the Harvard Observatory as constituting 'a structure that will probably never be duplicated in kind or extent by a single individual.'

William Herschel (1738-1822), the German-English astronomer who discovered the planet Uranus and became the most famous astronomer of his time, was a music teacher to begin with and entered astronomy as a hobby. Because he couldn't afford to buy good telescopes, he made his own – the best instruments in the world. He would sit grinding the lenses for hours and hours while his sister Caroline read aloud to him to distract him and fed him a mouthful at a time. Caroline went on to do astronomical work of her own, discovering eight comets, and lived to the age of ninety-eight. She devoted herself entirely to William and to his son, John (another great astronomer), and never married.

Galileo became totally blind shortly before his death, probably because of damage done to his eyes during his many years of looking at the sun through the telescope.

A war was ended by a solar eclipse - and became the oldest event on Earth that can be dated to the exact day. The armies of Lydia and Media were preparing for battle in Asia Minor when the eclipse occurred. Sobered by the event, the two nations signed a peace treaty. Modern astronomers have fixed the date of that eclipse at May 28, 585 B.C.

The largest refracting telescope, the forty-inch Yerkes telescope, was built in 1897, and is still in use. All larger telescopes are of the 'reflecting' variety, using mirrors rather than lenses.

The villagers of Gonesse, France, were sure there was no fire from the sky was the work of Satan [illegible] with pitchforks, they [illegible] to the tail of a horse, which dashed off [illegible] asunder. It had been a rather [illegible] bassoon - one of the first, in the year 1763.

The telescope was first [illegible] as a war weapon for [illegible] enemy ships at a distance. The Netherlands [illegible] telescope was invented as [illegible] leader, Maurice of Nassau, wanted to keep the invention secret.

An English lawyer Chester Moor Hall worked out in 1733 the principle of an 'achromatic' telescope by putting together a lens with two kinds of glass. To keep secret [illegible] had two lensmakers work on the two [illegible] lenses. Each lensmaker turned out to be [illegible] and so contracted him too, each used the same contractor [illegible] secret was out.

It took many years for the German astronomer Johann Kepler to make his observations of the heavenly bodies and work out the computations that led to his discovery in 1609 that the planets moved in elliptical orbits. In 1972, a computer given Kepler's data performed the necessary computations in eight minutes.

The Hale telescope, the 200-inch, 20-ton mirror at Mount Palomar Observatory in California, had to be cooled for nearly a year after it was cast. It then was ground and polished on and off for eleven years. By the end of the process, over five tons of glass had been worn away and 62,500 pounds of abrasives had been used in creating the desired shape and surface.

Even two centuries ago, an 'iron curtain' cloaked scientific achievement in Russia. The reason then was that so few Westerners understood Russian. In 1761, the Russian chemist Mikhail Lomonosov became the first to observe the atmosphere of Venus (during its transit across the sun), but the discovery remained unknown outside the country for 150 years. Lomonosov was the founder of Russian science, and would have been renowned if he had lived in western Europe. He published the first history of Russia, prepared the first accurate map of the country, wrote a Russian grammar that reformed the language, helped to found the University of Moscow, and wrote poems and dramas.

There are massless elementary particles called 'neutrinos' which are emitted during the decay of certain other particles and pass effortlessly through the solid earth. The study of the sun by means of its emission of neutrinos is essential in gaining additional astronomical information.

There is only one constellation of the heavens that in olden times was reported to be named for a human object. Coma Berenices, 'Berenice's Hair.' While her husband, Ptolemy III, ruler of Egypt and Cyrene, was off at the wars, Berenice prayed for his safe return and, to ensure it, about 247 B.C., had her long hair cut off and dedicated to the gods in a temple of Aphrodite. The hair was stolen, but the astonomer Conan of Samos was tactful enough to explain it had been taken by the gods to heaven. He pointed out some faint stars that, he insisted, represented her hair.

The year is previewed in Bhutan by astrologers. If a particularly unlucky coincidence of signs for a combination of day and date is discerned, the calendar is fixed so that the day and date do not occur as they occur elsewhere. Bhutan, in the east Himalayas, has been known to skip a whole month, e.g.,

there might be no December, but then there are two January"

Nicholas Copernicus (1473-1543), the Polish astronomer, maintained that the stars showed parallaxes (alterations in the relative apparent positions of objects produced by a shift in the position of the observer) used in astronomy to determine distance, but that they were too small to be measured. Observational evidence supporting this Copernican system of planetary motion was not collected until three centuries after his death.

Astrology was not the 'father' of astronomy (astronomy is much older), but it was closely tied to the development of mathematics, medicine, chemistry, and biology. Mathematics supplied the tools for understanding and predicting the movements of heavenly bodies upon which astrological forecasts were based. Observations and experiments in medicine and the life sciences were spurred by astrological predictions concerning life, death, and health.

Sir William Herschel, who dethroned the sun as the motionless center of the universe (as Copernicus had dethroned the Earth as the motionless center more than two centuries earlier), doubled the extent of the known solar system and became the most important and successful astronomer of his time. Before his time, only 100 nebulas had been known. Sir William's catalog contained about 2,500. He also discovered the planet Uranus and the sixth and seventh satellites of Saturn. But he believed that the moon and the planets were inhabited, that the luminosity of the sun might be confined to its atmosphere, that under the sun's heat of fire was a cold, solid body that might even be inhabited, and that sunspots were holes in the atmosphere through which the

cold surface could be seen.

The diameter of the first distant star to be measured, Betelgeuse, is approximately 240 million miles, making it 250 times bigger in diameter than our sun. Twenty-seven millions of our sun could fit into the body of Betelgeuse. The measurement was made by the American physicist Albert Abraham Michelson, who won the Nobel Prize in 1907, and is known especially for his determination of the velocity of light.

Girolamo Cardano (1501–76), the great mathematician, was a firm believer in astrology. He went a little too far, however, when he tried to cast the horoscope of Jesus, *that* had him imprisoned for blasphemy for a while. On the other hand, he cured a Scottish cardinal of asthma by forbidding him to use feathers in his bed — the first case of an understanding of what we now call 'allergy.' There is a story — probably false — that Cardano predicted astrologically the day of his own death. When the day, September 21, 1576, found him in good health, he committed suicide.

The German astronomer Johann Bayer (1572–1625) felt it was blasphemous to have the constellations named for characters in Greek mythology. He introduced a new system in which the northern constellations were named after people in the New Testament and the southern constellations after people in the Old Testament. It didn't catch on.

The island of St. Helena, in the South Atlantic, 1,200 miles west of Africa, has had at least two famous residents. Prior to Napoleon's exile in the early 1800s, Edmund Halley was there, in 1676, to map southern skies.

At an eclipse of the sun, the Ojibwa Indians of North America and the Senecis of Peru shot flaming arrows into the sky, hoping thus to rekindle the light. At the autumnal equinox, ancient Egyptians held a festival called 'the nativity of the sun's walking stick' in the belief that the declining sun needed **a staff to lean upon.**

Tycho Brahe, the most prominent astronomer of the late sixteenth century, was extraordinarily quarrelsome and arrogant. Over a point in mathematics, he foolishly engaged in a midnight duel that cost him his nose. He was only nineteen years old at the time – 1565. For the rest of his life (thirty-six years), he wore a false nose of metal.

The first man to determine the distance from Earth to a star was the Scottish astronomer Thomas Henderson. He did it at the Cape of Good Hope, in 1833. He decided to wait until he got back to Scotland before publishing his results – but by that time the German astronomer F. W. Bessel had also determined the distance of a star and had published it. Bessel therefore got the credit, which as a rule goes to the first who publishes, not **the first who discovers.**

In 1704, the English astronomer Edmund Halley (1656-1742) noticed similarities in the paths of the comets of 1531 and 1607 with the comet of 1681 which he himself had first observed. He declared they were the same comet and predicted it would return about 1758. It returned in 1759 – seventeen years after Halley's death – and it has returned twice since then, in 1835 and in 1910.

In his search for a trans-Neptunian planet – that is, one with an orbit lying beyond that of Neptune – Clyde Tombaugh at

the Lowell Observatory found himself at times struggling with a single photographic plate that contained as many as 100 000 stars. His mission, using many plates, was to see if any of the stars had moved

SOLAR SYSTEM

As recently as half a century ago, there was no clear understanding as to why the sun shines. The discovery that it is due to nuclear-fusion reactions was not made until the 1930s, by Hans Bethe and Carl von Weizsäcker.

At its center, the sun has a density of over a hundred times that of water, and a temperature of 15–20 million° C.

In 435 B.C., the Greek philosopher Anaxagoras suggested that the sun was not just a small glowing circle of light. He maintained that it was a glowing rock a hundred miles across. For that outrageous statement, he was exiled from Athens.

The rings of Saturn are not solid, flat discs as they appear to be in illustrations. They are made up of billions of tiny particles, probably ice-coated rocks. Each ring circles Saturn at a different speed. The rings are only about ten miles thick. In 1978, rings were unexpectedly discovered around Uranus and Jupiter.

The pressure at the center of the sun is about 700 million tons per square inch. It's enough to smash atoms, expose the inner nuclei and allow them to smash into each other, interact, and produce the radiation that gives off light and warmth.

Want to reach the outermost planet of the solar system in twenty-five years instead of in the forty-seven years that a direct flight would take? If so, be sure to be launched first toward Jupiter. Passing through that giant planet's gravit-

ational field, your spaceship would receive an added boost on its way to that most distant planet Pluto

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The sun is colossal. It contains 99 8 percent of the total mass of the solar system. More than one million Earths would be required to match its volume.

The most dramatic astronomical discovery in the last half of the nineteenth century was the 'canals' of Mars, in 1877 People speculated about them and tried to use them as proof of intelligent life on Mars, and they inspired H G Wells to write the very first 'star wars' book, *The War of the Worlds*, in 1898 The canals turned out to be only an optical illusion

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The pressure at the center of the Earth is 27,000 tons per square inch At the center of the giant planet Jupiter, the pressure is three times as great

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There is a correspondence between the fluctuation of agricultural production and sunspot variations. Production of wheat, for example, reaches high figures during sunspot maximums and low figures during sunspot minimums

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The moon is always falling It has a sideways, motion of its own that balances its falling motion It therefore stays in a closed orbit about the Earth, never falling altogether and never escaping altogether

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The least massive star known is Luyten 726-8B It has only 0 04 percent the mass of the sun, and it barely shines. It is only forty times as massive as Jupiter Somewhere in that forty-fold difference in mass is the borderline between planets and stars.

Some subatomic particles discovered by nuclear physicists have a lifetime of just a few trillionth of a trillionth second. In this moment light – which travels from the sun to Earth in 8 seconds – moves to no more than the width of a proton.

During an eclipse of the sun in 1868, spectral lines were located that were attributed to an unknown element that was called 'helium' from the Greek word for sun. Thirty years later, helium was discovered on the Earth.

The sun is about midway in the scale of star sizes, but most stars are smaller ones. Only 9 percent of the stars in our galaxy are larger than the sun. (That's five billion larger stars, however.)

At a height of a hundred miles, air is only a billionth as dense as it is on the Earth's surface. Even so, the total amount of air that is higher than the hundred-mile level comes to 6 million tons.

Jupiter is the largest planet, and it has the shortest day. Although Jupiter had a circumference of 280,000 miles, compared with Earth's 25,000, Jupiter manages to make one turn in nine hours and fifty-five minutes.

The heaviest known meteorite to fall to Earth – the Hoba West meteorite – lies where it fell in Africa. Weighing about sixty tons, it is not likely to be moved.

Polaris, in the tail of the Little Bear constellation, is the closest visible star to true north and thus is referred to as the North Star. By about 2100 A.D., the wobble of the Earth's

axis will slowly begin pointing the North Pole away from Polaris. By the year 14,000 A.D., the new North Star will be Vega.

Millions of meteorites fall against the outer limits of the atmosphere every day and are burned to nothing by the friction.

The discovery of Neptune was announced in 1846. But when astronomers checked, they found the record of an observation of the planet as far back as 1795 by astronomers who, believing it to be a star, recorded the position routinely.

Every year, it takes the moon two-thousandths of a second more to circle the Earth than it took in the previous year, as it slowly recedes from the Earth. Long before the moon recedes to much more than its present distance, the sun will have come to the end of its existence as a normal star

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Total eclipses of the moon are considerably rarer than total eclipses of the sun. However, a total eclipse of the moon can be seen from anywhere on the side of the Earth facing the moon. A total eclipse of the sun can only be seen from a narrow band about a hundred miles wide at the most The person who doesn't travel is sure to see a far greater number of lunar eclipses than solar eclipses.

The sun's total lifetime as a star capable of maintaining a life-bearing Earth is about 11 billion years. Nearly half the time has passed.

The moon fits snugly over the sun It is a sheer astronomical

accident, and it is what makes a total eclipse possible. The moon is just large enough to cover the sun completely, at times, as seen from the Earth. It is also small enough so that during the sun's obscuration the corona, especially the brighter parts near the body of the sun, is completely visible. There is no astronomical reason why moon and sun 'fit' so well. The Earth, among all the planets, is the only one blessed in this fashion.

One of the planets lies on its 'side' - Uranus - and there is no adequate explanation as to why. The extreme axial tip of Uranus is 98° as it revolves around the sun. The axis of Earth is tipped at 23.5°, Mars at 24°, and Jupiter at only 3°.

It was as late as 1835 that the mass of the planet closest to the sun, Mercury, was finally determined. The determination was made from the effect of Mercury's gravity upon the orbit of the close-passing Encke's comet, the first short-period comet to be discovered, and the comet with the shortest period, as it turns out. A number of comets have orbits of known periods of revolution. Some of these range from dozens to hundreds of years. About forty-five have short periods of less than ten years.

Saturn's rings are briefly visible to astronomers every fourteen years. At that time, the plane of the rings (which are not solid but consist of discrete particles), is tipped to that of the Earth's orbit, and they are seen edge-on - that is, they are so thin that they then can't be seen at all from the Earth, which is hundreds of millions of miles distant.

The first Greek astronomer to suggest the sun was the center of the solar system was Aristarchus of Samos, about 290 B.C. No one took him seriously, and his writings no longer exist.

The only reason we know of him is that Archimedes (whose writings do exist) referred to Aristarchus as holding this apparently nonsensical notion.

A giant solar flare temporarily knocked out Britain's entire radar system during World War II. The flare also gave the first indication of the existence of solar cosmic rays. The flare apparently had sent out a flood of microwaves toward the Earth that succeeded in handily drowning the man-made radiation that fed the radar system. Thus, it was discovered that the sun radiated in the radio-wave region of the spectrum. By the time World War II was over, astronomers were ready to turn to radio astronomy in earnest.

The Earth and the moon circle each other. The center of gravity about which both circle is located 1,000 miles beneath the surface of the Earth. The center of the Earth makes a small circle about that center of gravity every 27⅓ days. The center of gravity always remains on a straight line between the center of the moon and the center of the Earth. The Earth's turning about the center of gravity is a third motion, in addition to its turning about its axis (rotation) and its turning about the sun (revolution).

Mars' Olympus Mons (Nix Olympica), which is over 300 miles wide at the base, is twice as wide as the largest volcano on Earth – the one that makes up the island of Hawaii. The top of the crater of Olympus Mons is over 40 miles wide.

A system of Martian canyons dwarfs anything on Earth. It stretches across a distance equal to the full breadth of the U.S. The Canyons are up to four times as deep as the Grand Canyon, and up to six times as wide.

Jupiter's Great Red Spot is 25,000 miles wide. The spot may be the vortex of a hurricane that has been whirling for at least seven centuries.

Uranus nearly came to be named Herschel - for its discoverer in 1781, the German-born English astronomer Friedrich Wilhelm Herschel. The proposal was defeated when it was decided that planets would not be named for persons. (Herschel dropped the Friedrich and changed the Wilhelm to William after becoming an Englishman.)

In the entire history of the solar system 30 billion comets may have been lost or destroyed. That amounts to only 30 percent of the estimated number that remain.

Jupiter is two and a half times larger than all the other planets, satellites, asteroids, and comets of our solar system *combined*.

The tails of comets generally point away from the sun whether the comet is approaching the sun or receding. Tiny dust particles surround a comet. They are swept into a long tail by the solar wind, which consists of subatomic particles speeding outward from the sun at speeds of hundreds of miles per second.

Though Mars at its closest approach to Earth is only 34.6 million miles distant in a straight line, each of the Viking spaceships had to travel 440 million miles on an elliptical orbit for a guided landing on the red planet.

If we imagined the entire solar system shrunk in size to the point where it would fit in the island of Manhattan, the sun would be only a foot across. On the same scale, the nearest star

Alpha Centauri, would be 5,500 miles away from Manhattan – that is, in Jerusalem.

Every 584 days, Venus passes between Earth and the sun. In that interval, Venus rotates exactly five times on its axis. This means that every time Venus passes between Earth and the sun, it presents the same face to Earth. Astronomers can't figure out why this should be. Either Earth's gravity has an effect on distant Venus, which seems unlikely, or it is a pure coincidence, which also seems unlikely.

It has been estimated that at least a million meteors have hit the Earth's land surface, which is only 25 percent of the planet. Every last trace of more than 99 percent of the craters thus formed has vanished, erased by the effects of wind, water, and living things.

Pluto's lone moon, discovered in 1978 by astronomers at the U.S. Naval Observatory, is apparently only 12,000 miles above the surface of the planet and in synchronous orbit. An observer on Pluto would always see the moon in the same place in the sky, and the moon would not be seen at all by an observer on the opposite side of the planet. Thirty-three moons in all have been detected around seven of the planets – Venus and Mercury are not known to have a satellite.) In discovering Pluto's moon, astronomers learned that Pluto itself is much smaller and lighter than had been believed – it is one-eighth the weight of Earth's only moon – and is, therefore, not heavy enough to exert the gravitational pull on 'neighbors' Uranus and Neptune that would be sufficient to account for irregularities in their observed motions. It is believed that something else – one or more massive objects, possibly even a 'new' planet – must be beyond Pluto's orbit and causing the perturbation of the orbits of the outer planets.

A man living on the moon could, for a while, easily keep up with the sharp-edged front of darkness that each day, with incredible speed, leaps across the landscape. At the equator, the night-day frontier moves at about 1,000 miles per hour.

A neutron star consists of matter so compressed that subatomic particles, chiefly neutrons, are in actual contact. If the sun were squeezed into a neutron star, it would be something like 8 miles across instead of 865,000 miles. A pound object placed on the surface of a neutron star would weigh 2 trillion pounds.

Not one single science-fiction story – not even Jules Verne – placed craters on Mars prior to their discovery. On the surface of Mars there are some four times as many craters as on our moon.

Myriads of small meteorites fell on the French town of L'Aigle on April 26, 1803, thus convincing the doubting Thomases of the French Academie des Sciences and astronomers everywhere that stories of stones from heaven were more than mere medieval superstition and old wives' tales. In other words, they should be studied seriously.

Olaus Roemer struggled with a puzzle in 1675. The satellites of Jupiter seemed to move around their planet at irregular times. In trying to solve the problem, the Danish astronomer found he had to assume that light traveled at a finite speed, and in so doing he was the first to work out the speed of light. The speed of sound, which is only a thousandth as great, was not worked out for another 343 years.

Copernicus knew of the astronomical views of the Greek

Aristarchus, who believed that the motions of the heavenly bodies could easily be understood if it were assumed that all the planets, including Earth, revolved about the sun and that the stars must be infinitely far away, because they seemed motionless. Copernicus mentioned Aristarchus' views in a passage in *De revolutionibus orbium coelestium* that he later eliminated, as though not wishing to compromise his own originality.

The comet of 1843 swung around the sun at a distance of only 80,000 miles above its surface. Nothing we know of has ever approached the sun more closely. The comet would have evaporated completely, of course, if it had stayed that close, but under the lash of the sun's gravity it swung around that mighty orb in about an hour and began to recede.

Only one satellite in the solar system holds a dense atmosphere. Titan, at 3,000 miles across the largest moon of Saturn. It is probably almost entirely ice. Prebiological organic chemistry may be in progress. Because of its moderately dense atmosphere and low gravity, Titan would be the easiest object to land on in the entire solar system.

The planet Neptune was discovered by mathematics. Because the planet Uranus did not move according to theory, there had to be a gravitational pull that was not being taken into account. Two men, John C. Adams in England and Urbain J. J. Leverrier in France, calculated where a planet *might* to be to account for Uranus's movements. An astronomer, John G. Galle, in Berlin, on September 23, 1846, looked at the spot they had indicated, and discovered Neptune in less than an hour.

By projecting the image of the sun onto a white screen, Joseph

Henry in 1845 was able with sensitive measurements of heat to show that sun [illegible] from the [illegible] an intuitive demonstration

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Afternoon temperatures on Mar[illegible] go up to a[illegible] F in some areas, and down to – 190° F at night

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Maps that show the solar system need to be [illegible] if they were published before 1979. The reason [illegible] no longer the most distant planet from the sun. Neptune [illegible]. In its 248-year orbital revolution around the sun, Pluto crossed Neptune's orbit in December 1978. Neptune and Pluto resume their more familiar positions in May 2127 as Pluto journeys to its farthest point from the sun—over 4.5 billion miles away.

SPORTS

Though a U S. Army officer, Abner Doubleday, is generally hailed as having invented baseball at Cooperstown, New York, in 1839, games called 'baseball' - embodying the idea of hitting a ball and running bases - were mentioned in English publications as early as 1744 and in America fourteen years before the Declaration of Independence Jane Austen's heroine in the 1818 novel *Northanger Abbey*, for instance, 'prefers cricket, baseball, to books.'

A pole vaulter, when he lands, may absorb up to 20,000 pounds of pressure per square inch on the joints of his tubular thigh bones.

Between 1920 and 1932, the Finnish track star Paavo Nurmi (1897-1973) set twenty world running records and won nine Olympic gold medals.

Between 1882 and 1887, Hugh L Daly played second base and shortstop and pitched for several major league baseball teams As a pitcher, he won seventy-four games, including a no-hitter, and he registered a long-standing record of striking out nineteen batters in a game Not bad for a man with only one arm

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So ferocious had the game become that during the football season of 1905 at least nineteen players died in college and high-school contests.

Track star Jesse Owens beat a race horse over a 100-yard

course in 1936. The following year, Olympic hurdler Forrest Towns beat a prize cavalry horse trained as a running jumper, in the 220-yard hurdles, using only five hurdles to give the horse a longer stride a fair chance.

Until Michael Murphy proposed the idea in 1908, sprinters on track teams had never taken a crouching start. A crouching start allows sprinters to push off into full stride and top speed almost immediately. Murphy coached Yale University, the University of Pennsylvania and U.S. Olympic track teams.

No one has explained the Minoan art duplicating the bull acrobats of ancient Crete. If we can believe this art, an acrobat would face a charging bull, grasp its horns and do a somersault over its back to the ground. The problem is that the feat appears to be impossible. No daredevil has been reckless enough to attempt it—at least not in our time.

Basketball is the only major sport entirely of American origin. It was invented in December 1891 by James Naismith, a Canadian and an instructor at the YMCA Training School (later Springfield College) in Springfield, Massachusetts. His students complained about the boring daily gymnasium class in marching and calisthenics. After much thought and trial and error, Naismith devised a game with two peach baskets and a soccer ball. In a few years, basketball was being played throughout the country, and after World War I, it became a major international sport.

Prize fights prior to the turn of the century lasted up to more than a hundred rounds (rounds were often determined by knockdowns) - with the fighters using bare knuckles (no gloves).

The first formal rules for playing baseball required the winning team to score twenty-one runs.

Two brothers from Lancashire, England, brought the cotton industry to Moscow in 1903. One of the brothers founded the first Russian football (soccer) team, the Morozovtsi, which held the Russian national football championship until 1914.

The Italian Tazio Nuvolari, considered by many to be the boldest and greatest automobile racing driver of all time, won the 1936 *Mille Miglia* by a flick of the light switch. Driving an Alfa-Romeo, he trailed the faster Maserati driven by Achille Varzi. With the last part of the race finishing in the dark, Nuvolari turned off his lights, leading his opponent to believe he was so far ahead that he eased off to a slower speed. Nuvolari rapidly overtook the unsuspecting Varzi. With a few miles to go, Nuvolari switched on his lights, flashed past the Maserati, and won.

The Metropolitan Museum of Art, in New York, houses the largest collection of baseball cards: 200,000.

A Russian, Nikolai Sologubov, helped the U.S. team win the Olympic ice-hockey championship in 1960 at Squaw Valley, California. The U.S. had never won the hockey title. All the team needed to do after unexpected victories over Canada and the Soviet Union was to defeat Czechoslovakia in the final game. After two periods, the Americans, playing lethargically in the thin air high in the Sierra Nevadas, were trailing, 4-3. During the intermission between the second and third periods, Sologubov, who spoke no English, went to the U.S. dressing room and, through gestures, suggested the Americans inhale oxygen. They did, and when they returned to the

ice, they were revived and eager enough to rout the Czechs, 9-4, and win the title.

In a dual track-and-field meet on May 25, 1912, Lafayette College had forty-eight men on its unbeaten squad and Carlisle Indian School no longer in existence had six. But one of the six was Jim Thorpe, probably the greatest all-around athlete the U.S. has had. He won the high jump, broad jump, shotput, discus, 120-yard high hurdles, and 220-yard low hurdles. He stumped to third in the 200-yard dash. His teammates contributed five other victories and Carlisle won, 71 points to 41.

The knuckleball baseball pitcher Hoyt Wilhelm hit a home run in his very first time at bat in the major leagues, and never hit another in more than 400 times at bat in his twenty-year career with many teams from 1952 to 1972. In his second season, he hit a triple and never hit another, and two doubles and hit only one more. His career batting average was .088.

O.J. Simpson had a severe case of rickets and wore leg braces when he was a child. Glenn Cunningham was badly burned when he was eight years old and was told he would never walk again, in fact it took him more than two years simply to straighten out his right leg. Simpson went on to set ground-gaining records in the National Football League, and Cunningham went on to become one of the greatest all-time mile runners, holder at one time of five world track records.

During the baseball rivalries between the two major leagues in the 1890s, the Pittsburgh Nationals, taking advantage of a technicality, signed a player from another club. The Nationals' president, J. Palmer O'Neill, was called J. 'Pirate' O'Neill, and his club became the Pirates.

Billy Sunday famous as an evangelist after 1903 and reported to have converted more than a million people during his career, was a professional baseball player from 1883 to 1891 with Chicago, Pittsburgh, and Philadelphia teams.

New York Yankee pitcher Ron Guidry became baseball's first player to make his batting debut in a World Series game, when he strode to the plate in the fourth game of the 1977 Series. Because of the American League's designated-hitter rule, which allows a team to substitute in the batting lineup a slugger for the (usually) weak-hitting pitcher, Guidry had never gone to bat in a regular-season game. The rule did not apply in that Series. (Guidry laid down a perfect sacrifice bunt.)

Ty Cobb of the Detroit Tigers played slightly more than a score of baseball seasons in the American League. He banged out 4,191 hits and posted a lifetime batting average of .367. As of the beginning of the 1979 season, Rod Carew was the leading active baseball batter with 2,082 hits and a lifetime average of .334. Few modern players average .300 or last as long as fifteen years, let alone Cobb's more than twenty.

Grand Duke Alexander, third son of the Russian Czar, went to Nebraska in 1872 to hunt buffalo. He brought along railroad cars, including two sleepers, a diner, and a refrigerator car stocked with grouse, quail, and caviar. His guide was U.S. Civil War General Philip Sheridan, and the rest of the staff included General George Custer, Buffalo Bill Cody, and 1,000 Sioux.

In 1959, for the first time in his remarkable career, Ted Williams of the Boston Red Sox batted under .300, hitting only .254 and ten home runs. The highest-paid player in sports that year, his salary of $125,000 would seem paltry by

today's terms, he was offered the same contract by the Red Sox to play the next season, and he refused. He's gotten more after management agreed to cut his salary by 28 percent ($35,000 - the maximum decrease allowed under baseball's rules. His view was that he had already been treated fairly and he didn't deserve as much as the Red Sox were offering. Ted Williams was one of the greatest natural hitters in the history of baseball. He had a lifetime batting average of .344 and a total of 521 home runs during his career. In 1941, Williams' batting percentage was .406 - no one since then has hit .400, which means that he hit safely at least four out of every ten times. Today, a player is considered a good hitter if he bats .275 to .300.

In Thailand, kite flying is a big-league sport with established teams, umpires, official rules, and a national championship. The competition involves fighting between kites controlled by teams of up to twenty men.

In 1954, Roger Bannister overcame physical and psychological barriers and became the first human to run a mile in less than four minutes. He did it in 3:59.4, in British Vancouver. Within two months, the four minute mile was beaten again, as it has been over 50 times since Bannister's unprecedented feat.

Before they were allowed to compete in the state of Indiana, boxers and wrestlers in 1954 had to swear under oath they were not communists.

For sixty-two years, baseball's greatest slugger, Babe Ruth, alone held the record - nine - for pitching the most one-season shutouts in the American League. In 1978 he became the co-holder, with Ron Guidry, of the record.

To boost attendance, the St. Louis Browns of the American

League signed up a midget in the 1951 season. Eddie Gaedel was three feet seven inches tall and wore a uniform numbered ⅛. He went to bat only once, in a game against the Detroit Tigers, and walked on four pitches. Midgets are now banned by the major leagues. The Browns that year also hired a team psychiatrist. The next year, they moved to Baltimore.)

There are more than 10,000 golf courses in the U.S.

Most professional sports have 'iron men' athletes who play most of the game. The basketballer Wilton Norman Chamberlain – at over seven feet, 'Wilt the Stilt' – was probably king of the iron men. A regulation game in the National Basketball Association is forty-eight minutes, but in one season Chamberlain played an average of more than forty-eight minutes a game – because of overtime periods. In his 13 seasons in the NBA, he logged 47,859 minutes, or just under 796 hours. Chamberlain never fouled out of a game.

STOP THE PRESSES

Although freedom of the press is guaranteed by the Constitution, the Lincoln administration not only censored the news but closed down publication of the New York *World* for anti administration editorials in 1862 and again in 1863, for alleged spy activity. When the New York *Journal of Commerce* satirized Lincoln in 1863, the paper was shut down and its editors arrested on Lincoln's personal orders.

Credit for inventing the quoted interview goes to Anne Royall, the first crusading American woman journalist. She interviewed every U.S. President from John Quincy Adams to Franklin Pierce, and exposed graft in federal departments and incompetence among employees high and low. She campaigned for Sunday mail service and against whipping in the Navy. She had a leg broken in Vermont by an irate Congregationalist, was horsewhipped by a young man in Pittsburgh, and fled Charlottesville, Virginia, with a mob of students at her heels.

The Detroit *Free Press* offered each of 120 households in Detroit and its suburbs $500 if the members of the household would not watch television for a month. Ninety-three of the families said no. Almost all members of the six families eventually chosen for the test were at times depressed, bored, and nervous.

Karl Marx and Friedrich Engels, the fathers of communism, wrote 500 articles for the New York *Tribune*, from 1851 to 1862.

The press response to President Lincoln's Gettysburg Address was primarily one of disdain; the Chicago *Times*, for instance, felt Americans should be embarrassed by the 'dish-watery utterances.'

In the 1530s, a printing press was set up in Mexico City, and the first Mexican newspaper was published there in 1541.

A French term for wartime propaganda, *bourrage de crane*, means 'brain-stuffing.'

The Ladies' Home Journal had to include a reference to whiskey and champagne – two beverages that were taboo in the magazine in the mid-1890s – in order to get the right to publish Rudyard Kipling's story 'William the Conqueror.'

The New York *Sun's* circulation reached a record peak when it printed a week-long series of articles (by the British-American Richard Adams Locke) purporting to reveal that Sir John Herschel – through the world's largest telescope – had discovered life on the moon. Furry batlike creatures 'were evidently engaged in conversation; their gesticulation ... appeared impassioned and emphatic ... they were capable of producing works of art and contrivance.' The hoax was perpetrated during a heat wave and a circulation war in 1835.

The three newspapers with the largest daily circulation in the world are all Russian. They are *Pravda*, 10 million, *Komsomolskaya Pravda*, 10 million, and *Izvestia*, 9 million.

Three hundred and fourteen acres of trees are used to make the newsprint for the average Sunday edition of *The New York Times*. There are nearly 63,000 trees in the 314 acres.

Horace Greeley did not originate the quote by which he is

best known 'Go west, young man' was originated by John Babsone Lane Soule in an article in the *Express* of Terre Haute, Indiana, in 1851. Acknowledging the source of the quote, Greeley reprinted and extended it in an editorial in his famous newspaper, the New York *Tribune*. 'Go west, young man,' Greeley wrote, 'and grow up with the country.'

The first newspaper to be published in colonial America was *Publick Occurrences Both Foreign and Domestic*. It appeared on September 25, 1690, but was shut down immediately by the Massachusetts governor and council because the publisher, Benjamin Harris of Boston, had not obtained a license.

The journeyman printer of the sixteenth century in Europe worked twelve to sixteen hours a day, printing from 2,500 to 3,500 sheets, an average of one printed sheet every twenty seconds. This rate was not exceeded until the late eighteenth century, and then only modestly. It wasn't greatly exceeded until November 29, 1814, when the London *Times* produced the first newspaper printed on a mechanical press that could turn out 1,100 sheets an hour.

The first known political cartoon, printed in 1747 in a pamphlet called *Plain Truth*, published by Benjamin Franklin, is credited with raising 10,000 volunteers for the Pennsylvania Militia.

Benjamin Franklin founded the first foreign-language newspaper published in America, the German *Philadelphia Zeitung*, 1732. It expired after only a few issues.

A substantial proportion of the printers and newspaper publishers in colonial America were women. Six women served as official printers to provincial governments. John Zenger's wife ran his newspaper while he was in jail in 1734.

on a libel charge in the first freedom-of-the-press case in the colonies.

The first newspaper in Turkey was founded in 1831. By midcentury, there were more newspapers, but all were officially censored and all controversial and troublesome stories were changed or omitted. Regicide and similar crimes could never be reported. When U.S. President William McKinley was assassinated in 1901, it was reported he had died of anthrax. When the King and Queen of Serbia were murdered in 1903, Turkish readers were told they had died of indigestion.

Extraordinary precautions were taken to prevent photographers from showing the public what occurred on the floor of the New York Stock Exchange. The first published picture, which appeared in *Pear's* magazine in 1907, was made through the empty sleeve of a coat that concealed the camera from the sharp eyes of the exchange's guards.

A disastrous hurricane in 1772 swept over St. Croix and is described as having 'blown Alexander Hamilton into history.' The hurricane made such a vivid impression on young Hamilton that he wrote a long letter to his father, then living on St. Vincent Island. A minister named Hugh Knox saw the letter and had it published in the *Royal Danish-American Gazette*, where it received much acclaim. Through Knox's efforts and other helping hands, it was arranged for Hamilton to attend Columbia (then King's) College. He was on his way.

American cattle barons grabbed land every way they could. One favorite method was to advertise in the local paper. The *Glendive Times* (Montana), of April 12, 1884, carried this ad: 'I, the undersigned, do hereby notify the public that I claim the valley branching off the Glendive Creek as a stock range. Chas. S. Johnson.' Western papers in the 1870s and 1880s

carried columns of such ads which read like legal notices. They had no legal value whatever, but they worked.

Apparently because it could not locate a copy in any of its libraries, the Soviet Union was obliged to ask the Hoover Institution on War, Revolution and Peace, at Sanford University, for a microfilm copy of its original edition of the first issue of *Pravda* dated March 5, 1917.

Seven days before the Wright brothers first flew a powered heavier-than-air ship, in 1903, an editorial in *The New York Times* said that 'time and money spent in airship experiments are wasted.'

When a vigilante organization raided a communist bookshop in Oklahoma City in 1940, it seized a number of publications thought to be 'advocating violence' and publicly burned them at the city stadium. Among the publications picked for destruction were the Declaration of Independence and the Constitution of the United States.

An American woman became the most famous reporter of her time. In 1889, Nellie Bly traveled around the world to 'race' against the fictional male hero of *Around the World in Eighty Days*, she beat him by eight days. Accompanying her fame was a scandalous fact: Miss Bly traveled alone. When she died, in 1922, she was buried in an unmarked grave. In 1978, the New York Press Club dedicated a stone to Nellie Bly at Woodlawn Cemetry in New York City.

The woman who has appeared most on the covers of *Time* magazine is the Virgin Mary – ten times.

When her husband was elected President in 1932, Eleanor Roosevelt was editor of the magazine *Babies*.

Elizabeth Cochrane Seaman – better known as the adventurous and enterprising journalist Nellie Bly – had herself committed under a pseudonym for ten days to New York's Blackwells (now Welfare) Island. The narratives she wrote for the New York *World* in 1888 resulted in a grand-jury investigation of the asylum's neglect of its patients and in subsequent improvements in their care.

STRANGE HAPPENINGS

An American student, Charles Martin Hall, then twenty-two years old, heard his chemistry teacher say that anyone who could devise a practical way of separating aluminum from its ores would grow rich. Hall went home to his own laboratory, experimented, devised such a method – and grew rich. That very same year, 1886, a French chemist, Paul Heroult, devised the very same method. He was twenty-two years old also. Both Hall and Heroult died exactly eight years later, each one died one month past his fifty-first birthday.

An international 'kingdom of occultism' took in parts of France, Switzerland, and Germany in the eighteenth century. Freemasons, Rosicrucians and assorted mystics traveled through this underground 'kingdom,' exchanging ideas and describing their visions. A sorcerer like Alessandro Cagliostro (1743-95) could always rely on other occultists to give him secret lodgings in centers like Lyons, Strasbourg, and Zurich.

Helen Keller (1880-1968), blind and deaf from an early age, developed her sense of smell so finely that she could identify friends by their personal odors.

The slave Henry Brown escaped from Virginia in 1858 by hiding with a box of biscuits and a bladder of water in a box that was shipped from Richmond to Philadelphia. There, he popped out into 'the free world.' He was forever after known as 'Box' Brown.

A black cook named Tillman commandeered the last prize ship taken by a Confederate privateer during the Civil War One night, Tillman killed the captain and mates of the prize crew with an ax, and then forced the survivors to sail to Sandy Hook in New York Harbor, where he turned them in The feat gained him and his ax a job with Barnum's circus.

Upton Sinclair's blistering novels of social protest ripped the fabric of American industry at the start of the century Three decades later, Sinclair's cousin Wallis Warfield Simpson ripped the fabric of British royalty by becoming the great and good friend of King Edward VIII (Fear of a threat to constitutional procedure forced Edward's abdication, in 1936, and a year later he married the divorcée.) Both Sinclair and Simpson were Baltimoreans

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Nearly 87 percent of the 103 people asked in a poll in 1977 were unable to identify correctly an unlabeled copy of the Declaration of Independence (The poll was conducted at a shopping area in Fort Lauderdale, Florida.)

The two greatest writers in their respective languages - William Shakespeare and Miguel de Cervantes - died on the very same day in the very same year, April 23, 1616 They probably did not know of each other. Two men who knew each other well - the second and the third Presidents of the U.S., John Adams and Thomas Jefferson - died on the very same day in the very same year, the Fourth of July in 1812 Adams's last words were 'Jefferson still lives' Jefferson had died, however, a few hours earlier (The fifth President, James Monroe, also died on a Fourth of July 1831.)

The Soviets are buying skateboards from the United States - but not for recreational purposes They see them as an answer to some of the country's transportation needs, because the boards are less expensive than bicycles and require little

storage space. The first boards went to school instructors so they could train pupils how to ride them.

The German chemist Emil Fischer worked on important tissue compounds, the sugars and purines, and was awarded a Nobel Prize in 1902 for that work. Despondent over Germany's defeat in World War I and over the loss of two of his three sons and his own death, he killed himself shortly after the war's conclusion. A young assistant, Hans Fischer, won recognition while working on many of the same compounds, the porphyrins, and was awarded a Nobel Prize in 1930 for that work. Despondent over Germany's defeat in World War II and over the destruction of his laboratory by air raids, he killed himself shortly after the war ended.

The Sûreté, the French precursor and modern counterpart of the FBI, was founded in 1812 by a man who had been Public Enemy Number One of the Paris rogue gangsters. Eugène-François Vidocq, a thief and convict, evaded the police for years, turned police informer, joined the force as a detective and used his knowledge of crime to establish the crime-fighting organization, the Sûreté.

Without a parachute, a Russian survived a 21,980-foot fall from a damaged plane. Lieutenant I. M. Chisov fell on the steep side of a snow-covered mountain and slid to the bottom, breaking his pelvis and damaging his spine.

The Vikings established a colony on the southwestern coast of Greenland that lasted about four centuries, from 982 to nearly 1400. The colonists routinely got their wood from North America by sea; there was none on Greenland, even though the land had not yet been discovered. In the late 1300s, the Black Death ravaged the northlands, the Icelos

attacked the colony, the climate grew colder, and the colonists finally died or left.

The carpenter who built the first stocks in Boston in 1634, a man named Palmer, was the first to occupy them. When he submitted a bill for 1 pound, 13 shillings, the town elders thought it to be excessive and had Palmer charged with profiteering. He was found guilty, fined 1 pound, and sentenced to spend a half-hour in the stocks that he had recently constructed.

To help determine on what floor it should have its offices in one of the two 110-story skyscrapers of the World Trade Center, in lower Manhattan, a Japanese company hired a soothsayer to throw dice.

At the 'worker control room' at Matsushita Electric Company in Japan, workers beat, with bamboo sticks, dummies of their foremen, thereby letting off steam, grievances, and tensions before heading for home and kin, presumably for a more peaceful weekend. (Matsushita's business grew by 30 percent a year for twenty-five consecutive years.)

When Alexander Graham Bell was working on the telephone in 1876, he spilled battery acid on his pants and called out to his assistant, 'Watson, please come here. I want you.' Watson, who was on another floor, heard the call through the instrument he was hooking up, and ran to Bell's room. Bell's were the first words anyone spoke on the telephone. In 1915, when the first transcontinental telephone line was opened, the first person who spoke into it was Bell on the East Coast. His words were, 'Watson, please come here. I want you.' This time Watson couldn't come. He heard the plea, but he was in California, 3,000 miles away.

There was rioting in England when the Gregorian calendar was adopted and September 3, 1752, became, just like that, September 14. Many people insisted they had been deprived of eleven days.

A young man named Steve Brodie began telling friends around New York's Bowery in 1886 that he was going to jump off the Brooklyn Bridge as a stunt. For several months he talked about it, and on July 23, the day of the event, he spent a long time in a tavern getting ready. A friend drove him in a wagon to the center of the bridge and left him there. A policeman saw an object fall in the dark to the East River below and a rowboat picked Brodie out of the water. Brodie became famous and opened a saloon where people listened to him describe his deed. There is no proof that he did jump or that he did not. Another young fellow, named Larry Donovan, later made the leap before witnesses. He survived, and was fined $10 for obstructing traffic.

The world's largest building without internal supports is the Goodyear Airship hangar, in Akron, Ohio. It has 55 million cubic feet of air. Clouds form in the top of the structure during sudden temperature changes, and it rains.

During the Gold Rush days in California, Charlie Parkhurst was a stagecoach driver, taking passengers and gold shipments along dangerous roads. Charlie smoked cigars, chewed tobacco, played cards, and drank. He shot dead two highwaymen. Charlie retired and went into the cattle business in Santa Cruz, California. On December 31, 1879, some neighbors found old Charlie dead at home. When they got around to dressing the body for burial, they discovered that Charlie Parkhurst was a woman.

In 1929, the U.S.S.R. decreed a week of five days. In 1932,

the U S S R. decreed a week of six days. By 1940, the seven-day week had been restored.

Because many scientists believed they owed a debt of gratitude to John Scopes for his role in the internationally publicized Tennessee 'monkey trial,' they helped to establish a scholarship at the University of Chicago so that Scopes could study geology there. Scopes had been tried for teaching evolution in a Dayton, Tennessee, school in the face of a state statute that prohibited the teaching of theories contrary to the accepted biblical interpretation of man's creation. Controversial trial lawyer Clarence Darrow defended Scopes, and former Presidential candidate William Jennings Bryan worked with the prosecution. Scopes was convicted. When his case went before the Tennessee Supreme Court on appeal, Scopes was so engrossed in his studies that he had little interest in the proceedings, and did not bother to return to Tennessee. The high court reversed the lower court's decision that Scopes be fined $100.

The two most illustrious people in England at the close of the sixteenth century never set foot outside of 'this royal throne of kings, this scepter'd isle, this earth of majesty, this seat of Mars, this other Eden, demi-Paradise, This fortress built by Nature . . this little world, this precious stone set in the silver sea . . this blessed plot, this earth, this realm, this England.' The two were, of course, Queen Elizabeth and William Shakespeare; their achievements, however, have to this day influenced all of the world.

Once in the history of the U.S., a governor – instead of the President – issued a declaration of war against another nation. There was much argument over an uncertain Maine – Canada (New Brunswick) boundary that had persisted since the Treaty of Paris, 1783. When Canadian lumberjacks began to

build a road along the Aroostook River. American lumberjacks moved in to stop them. Tensions rose. Governor John Fairfield of Maine declared hostilities and mobilized the state militia, and New Brunswick mobilized its militia. The bloodless Aroostook war ceased when President Martin Van Buren sent General Winfield Scott to arrange a truce in 1839. The present border was agreed upon in the Webster-Ashburton Treaty.

The world's first iron bridge, built at Coalbrookdale, Shropshire, England, in 1782, was the product of three generations of Darbys. Abraham Darby I developed the use of coke, his son manufactured cast iron, his grandson built the bridge.

A Harvard student on his way home to visit his parents fell between two railroad cars at the station in Jersey City, New Jersey, and was rescued by an actor on his way to visit a sister in Philadelphia. The student was Robert Lincoln, heading for 1600 Pennsylvania Avenue. The actor was Edwin Booth, the brother of the man who a few weeks later would murder the student's father.

One man has been punished for libel both in the U.S. and England. In his native England, the fiery anti-establishmentarian and master of vituperation William Cobbett was sued for attacking, without evidence, abuses in the military. He was imprisoned for two years. In the U.S. Cobbett joined the Federalists in attacking the Republicans, and was sued, in 1799, for $5,000 by Dr. Benjamin Rush.

During the reign of Alexander II in Russia (1881-94), many liberal reforms were instituted, including a judiciary system operating in open courts, oftentimes with juries. But in 1878 a young girl, Vera Zasulich, assassinated the governor-general of St. Petersburg in reprisal for punishment of a political

prisoner. She was tried and acquitted by a jury. As a result the government abolished jury trials in political cases.

Eleven days before the statute of limitations was to expire on the Brink's robbery in Boston, Massachusetts, that netted nearly $3 million in January 1950, one of the robbers confessed and betrayed his fellow robbers.

When a suspension bridge was being built over the gorge near Niagara Falls, New York, there was no way a boat could carry the necessary suspension wires across the violent waters. The builders of the bridge were inspired to offer $5 to the first boy to fly a kite from the American to the Canadian side. It worked. Once the kite string made the crossing, a succession of heavier cords and ropes tied to the kite string was pulled over until the first length of cable finally spanned the river.

The snow-capped 'land of the thunder dragon' - Bhutan, north of India - issued a postage stamp that is actually a tiny phonograph record. It plays, naturally, the Bhutanese national anthem.

In July 1585, 108 Englishmen landed at Roanoke Island off the coast of North Carolina. Sponsored by Sir Walter Raleigh, the settlers built a fort and houses, planted crops, and sought gold. Hurricanes and hostile Indians forced them to return to England within a year. In 1587, another 118 colonist arrived, among them the parents of Virginia Dare, the first English baby to be born in the New World. The leader of the colony, John White, sailed back to England after a few weeks in order to get more provisions. When he returned to Roanoke in 1591, he found it deserted. The word 'CRO-ATOAN' was carved on a tree, and no one to this day knows what happened to the settlers.

Minoru Genda, a Japanese general who helped to plan the

attack on Pearl Harbor, was awarded the United States Air Force Legion of Merit in 1954. This occurred when Grenda was [illegible] Japanese aircraft [illegible] he had test-flown Lockheed's P-38 Starfighter [illegible]. His recommendation was a factor in Japan's purchase of the planes.

The classical period of Mayan culture lasted six centuries and then collapsed for reasons that have never been explained. Theories range from an epidemic to bad farming methods that exhausted the land. The mystery is that the great Mayan cities flourished at the beginning of the ninth century and were ghost towns by its end.

Until the U.S. Post Office laws were strengthened in the 1870s, a big and profitable mail-order business was the selling of mechanical devices to help gamblers to cheat. Known as 'advantage tools,' these devices included marked cards, loaded dice, cutters and trimmers for shaving edges on cards, sleeves and vests for holding extra cards and shiners or 'spies' for reading the opponent's cards.

Oak Island off the coast of Nova Scotia has a mysterious deep shaft that has resisted exploration because the water cannot be pumped out. All that has been discerned is that the shaft was dug and lined with logs in the eighteenth century by an unknown band of men.

In 1695, two scientists obtained a diamond from a rich patron and heated it by using a lens to focus light on it. The diamond disappeared. Diamond is made of carbon, and it burns just as coal will when it is heated strongly enough.

Columbus was returned to Spain in chains after his third trip to the New World. He was charged with tyrannical mismanagement of the Haitian colony. On his fourth voyage,

he tricked the Indians by predicting an eclipse he knew would occur

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The celebrated seventeenth-century pirate William Kidd was a wealthy landowner in New York.

All the time that the public prosecutor's office in Germany was searching for the family of Adolf Eichmann, it was duly registered in Buenos Aires with the German embassy, whose staff maintained rare discretion

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U S Congressmen expressed surprise on learning in 1977 that it takes fifteen months of instruction at the Pentagon's School of Music to turn out a bandleader but merely thirteen months to train a jet pilot

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After being evacuated to England in 1961, the 'primitive' people of the island of Tristan da Cunha voted two years later to return to their homes, though they would have only a remote chance of rescue if the 6,760-foot-high volcano on their island in the South Atlantic, about midway between South Africa and South America, erupted again.

On the night that John Wilkes Booth killed President Lincoln in Ford's Theater in Washington, D C , he also intended to assassinate General Grant The Grants had been invited to accompany the Presidential party to the theater, but declined in order to visit their children at school in New Jersey.

Winston Churchill was born in a ladies' cloakroom in the ancestral castle of Blenheim His mother was attending a dance there when she prematurely delivered.

Returning to his Minneapolis home from a political meeting

in 1947, Mayor Hubert Humphrey was shot at three times. The would-be assassin has never been traced.

Four months after falling off the *Orient Express* while wearing only pajamas, sixty-four-year-old Paul Eugene Louis Deschanel resigned as president of the French Republic. He miraculously had survived the mishap which occurred on the way to Lyon, in 1920, but he was unable to survive the merciless satires in night clubs and newspapers.

George Washington's mother caused him embarrassment during the Revolutionary War by complaining in public that she was starving. Actually, he was satisfactorily providing for her, but she was a cold woman, probably with Tory leanings, who deprecated her son's achievements and refused to appear at either of his inaugurations.

Mark Twain was born in 1835 when Halley's comet appeared. He predicted that he would die when Halley's comet next returned to scare everyone – and he did, in 1910. The comet will next return in 1986. The last time the comet was seen, superstitious people bought anticomet pills at $1 a box.

Two psychologists at Edgewater College, Cincinnati, Ohio, studied 34,318 criminal offenses committed over a one-year period in Hamilton County (Cincinnati), and reported in 1976 that eight categories occurred more frequently during or near the full-moon phase. The categories were rape, robbery and assault, burglary, larceny and theft, auto theft, offenses against family and children, drunkenness, and disorderly conduct.

There has been a blue moon. When a large amount of fine dust was sent into the upper atmosphere by huge Canadian forest fires in 1950, the dust caused a blue coloring in various parts of the world. Cars turned on their headlights in the

daytime, and at least one daytime baseball game was played under lights. In some places, people even reported a blue sun The phenomenon lasted at least two days.

STRANGE RULES, LAWS, AND CUSTOMS

The town of High Wycombe in Buckinghamshire, England, carries on the multi-century custom called the Weighing-in Ceremony. In early May, the town's mayor, mayoress, deputy town mayor, deputy mayoress, town clerk, and district councilors representing wards in the town's boundaries are weighed in order to learn if they have grown fat at the public trough. (The ceremony was banned when Cromwell and the Puritans came to power, in the seventeenth century, and revived in the nineteenth century.) The present weighing machine was a gift of a greengrocer. It consists of a red plush seat suspended from an overhead dial with a spring resistance. The whole is suspended from a large brass tripod, and it is known as Jockey Scales.

Over the centuries, playing cards have been put to strange uses. They became the first paper currency of Canada when the French governor, in 1685, used them to pay off some war debts. In 1765, the year of the Stamp Act – when every pack of playing cards was being taxed one shilling – they were used for class admission at the University of Pennsylvania. Napoleon used them as ration cards during the French Revolution.

It was proposed in the Rhode Island legislature in the 1970s that there be enacted a $2 tax on every act of sexual intercourse.

In 1853 Illinois passed a law that required any black entering the state and staying more than ten days to pay a fine of $50. If

he could not pay, the black could be sold into slavery for a period commensurate with the fine

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When the X-ray was discovered by Wilhelm Roentgen in 1895, some journalists were convinced that the primary user of the revealing shortwave radiation would be the 'peeping Tom.' The titillating publicity led to legal and mercantile steps. Two examples A law introduced in New Jersey forbade the use of 'X-ray opera glasses,' and merchants in London sold X-ray-proof underwear.

A law was passed in England requiring all corpses to be buried in a wool shroud, thereby extorting support for Britain's flagging wool trade. The act was repealed 148 years later, in 1814.

The U S Internal Revenue Service allows deductions of thousands of dollars for installation of an elevator in the home, but not a single penny for the heating and lighting of an exercise space in the basement (let alone for the construction of such an area) Prescriptions for possibly addictive medications are deductible, but vitamins that could well be supplementing a deficient diet are not Vanity surgery facelifts, breasts enlargements, eye tucks, nose jobs, and the like is allowable, but fees for a health club or for weight-reducing programs are not The tobacco industry can write off its advertising expenditures, but an individual may not deduct the expense of enrolling in a course to break the smoking habit.

In 1795, the National Convention in revolutionary France decreed a new calendar to educate the public to new ideas such as eliminating wasteful holy days, including Sundays and saint's days It was identical to that used in ancient Egypt Each year was divided into twelve months of thirty days each,

with five extra days at the end of the year. Each month had three ten-day weeks. This calendar was repealed in 1805, mainly because of the confusion caused by its abolition of the seven-day week. It had wreaked havoc with the traditional system of religious observances, festivals, and market days.

Even the shadow of a lower-caste person in India may be considered a defilement that falls on a Brahman, a member of the highest or priestly caste. Although current Indian law forbids the caste system, in practice many people who held these notions still hold them today.

Only 15,000 out of the 35,000 population of the tiny mountain principality of Andorra, wedged between France and Spain, could call themselves full citizens until recently. To become a true Andorran, tradition required the passing of three generations or the marriage of a daughter recognized as the **'heiress' of a family.**

The Tinguian people of the Philippines have their own way of kissing. They put their lips close to each other's face and **quickly inhale.**

As artists and traders in medieval cities began to form organizations, they instituted tough initiation ceremonies. Journeymen in Bergen, Norway, were shoved down a chimney, thrown three times into the sea, and soundly whipped. Such rites made belonging to the guild or corporation more precious to those who were accepted, and **survived.**

The average age of Elizabethan and Jacobean brides was about twenty-four and their bridegrooms around twenty-seven. The primary reason for delayed marriages was to limit births among poorer people. The higher the social status,

however, the younger the age at marriage

A 180-square-mile land of deep valleys and high Pyrenees Mountains - the principality of Andorra - is ruled by two foreign sovereigns: the bishop of the Spanish town of Seo de Urgel, south of the Andorran border, and the President of France. Seven centuries ago, a Spanish bishop and the French Count of Foix settled a long-term land dispute by agreeing to become co-princes of the Andorran valley. The Spanish title was handed down the centuries to the present bishop. On the French side, the title was passed to the kings of Navarre, then to the kings of France, and now to the presidents of France.

Wanton cruelty in the treatment of slaves was forbidden by the Code of Hammurabi, one of the most famous of ancient documents. It was promulgated in the King's name in Babylonia sometime between 2100 and 1800 B.C. The code, however, stipulated that slaves were to be branded on the forehead and forbidden to hide or mask the mark.

Common in Europe and the British Isles during the Middle Ages and later even in the New World was the practice of trying and condemning animals for injuring or killing a human being. For instance, the French parliament, the highest court in the land, ordered the execution of a cow. It was hanged, then burned at the stake.

As in Abraham's time, it was the custom among men in Rome, when swearing to tell the truth, to place one's right hand on one's testicles. The English word 'testimony' is related to this custom.

When a Chinese bystander ashore was killed accidentally by a salvo of greeting from an English ship, during the early days

(1830s) of the China-Western trade, the English were forced to turn over to China the Lascar gunner who was promptly strangled. Strangling was thought by the Chinese to be less severe punishment than, for instance, beheading because the body would not be permanently disfigured.

In the Andes, time is often measured by how long it takes to chew a quid of coca leaf. Sometimes, and not just in the Andes, a destination is said to be so many cigarettes away.

The minister of education in the bureaucracy of post-Napoleonic France could boast that he knew, given an hour, what every teacher in every school in the nation was teaching. A similar scholastic regimentation existed in each province of Germany into the twentieth century.

Charles Bradlaugh (1833-91), an English atheist, fought against the requirement to take oaths on the Bible. He was elected to the House of Commons in 1880, and refused to take the oath necessary for being seated. He was expelled, and was reelected and expelled again, in 1881, 1882, 1884, and 1885. He finally won his point and was allowed to affirm instead of swear. In 1888 a law made affirmation sufficient in the English courts.

The *Titanic* had a sister ship, the slightly lighter *Olympic*, which was built first. Upon being launched, the *Olympic* collided with the British cruiser *Hawke* and had to steer to Belfast for repairs. The Right Honorable Alexander Carlisle, the designer, was to remember a conference where lifeboat capacity was discussed for five or ten minutes, whereas the time allotted for the discussion of decorations for the liners ran up to five hours.

Captain William Kidd sailed in 1695 as a pirate-hunter

commissioned to help clear the Indian Ocean of buccaneers But he captured and plundered legitimate merchantmen, made the mistake of returning home to England, and was hanged for a pirate himself

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THAT'S ENTERTAINMENT

Charlie Chaplin broke into show business at age five because his mother, a music-hall performer, lost her voice during a performance and had to leave the stage. Young Charlie stepped forward and sang a well-known song. Halfway through the song a shower of money poured onto the stage. Charlie stopped singing and told the audience he would pick up the money first and then finish the song. The audience laughed. This was the first of millions of laughs in Charlie Chaplin's fabulous career.

Ethel Barrymore of Broadway's 'royal family' of actors often played royalty in her plays and movies. In one of her silent films, she had the role of a Russian princess. Among the extras was a Russian emigre tailor. His name: Leon Trotsky, who moved up to become a leader of the Bolshevik Revolution - which put an end to royalty in Russia.

The American chemist Robert Hare discovered that a blowpipe flame acting upon a rock of calcium oxide - which is lime - produces a brilliant white light that could be used to illuminate theater stages. We speak of someone who has the glare of publicity as being in the limelight.

Perhaps the most economical form of makeup ever used by actors was known in England as 'Sadler's Wells makeup.' All the actor needed for this makeup was a couple of empty tobacco tins into which he or she scraped some paint from the walls to use in coloring the face. For shadowing, the actor merely ran his finger along the shelf under the

dressing table and applied dust directly to the face.

In the mid-1960s, the motion picture director-producer Stanley Kubrick wanted from Lloyd's of London an insurance policy protecting against losses should extra-terrestrial intelligence be discovered before completion and release of his far out motion picture *2001. A Space Odyssey.* Lloyd's didn't take the chance

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England's fun-loving Prince of Wales, who later became King Edward VII, was fond of practical jokes Once he went on stage to play the role of a corpse in a scene in Sardou's *Fedora* when Sarah Bernhardt was weeping over the body of her murdered lover (Mme Bernhardt and the Prince were long-time friends. On the occasion of his coronation, she was invited to be one of a group of beautiful lady friends of the new king who were seated in what was called 'the King's Loose Box.')

Not until 1959 was a play by a black woman produced on Broadway Twenty-nine-year-old Lorraine Hansberry's *A Raisin in the Sun,* about the problems (comic and serious) of a black family in modern America, was successful and has been made into a motion picture

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By 1929, two years after introduction of the 'talkies,' motion pictures in the United States were attracting 100 million patrons every week.

A fifteen-minute radio serial, *Amos 'n' Andy,* which went on the air every week-night at 7:00, was so popular in the 1930s that most movie theaters throughout the United States changed curtain time to 7 15, because hardly anyone would go to the movies until they had heard the latest *Amos 'n' Andy* episode (In those days, the feature film was always preceded by a newsreel, at least one comedy, a

cartoon, a travelogue, coming attractions, and perhaps a specialty two-reeler. One had plenty of time to arrive before the main show began.)

The large number of drunken workers and children sparked a temperance movement in England after the 1850s. Temperance cafes, restaurants, and refreshment houses featured food or nonalcoholic beverages at modest prices. The first temperance music hall was founded in 1880 in a popular quarter of London. It became the Old Vic Theatre.

Northwestern University conferred an honorary degree on a dummy of the wooden variety - on ventriloquist Edgar Bergen's dummy, Charlie McCarthy.

The Nobel Prize-winning (1962) American biochemist James Watson, whose work with Britain's Francis Crick led to discovery of the molecular structure of deoxyribonucleic acid (DNA), the stuff of which genes are made, was a Quiz Kid on the popular radio show.

The great French actress Sarah Bernhardt was obsessed with death. As a teenager, she made frequent visits to the Paris morgue to look at corpses of derelicts dragged up from the Seine, and she begged her mother to buy her a pretty rosewood coffin with white satin lining. The coffin became part of the Bernhardt legend. Occasionally, she slept in it, and eventually she was buried in it when she died at seventy-nine.

The most extravagant and glamorous shows ever seen on Broadway were the Ziegfeld Follies. The reason was the beautiful Ziegfeld girls. Almost half of the costs for these expensive productions went for their costumes. These Broadway beauties slouched around the stage and hardly

ever smiled. In fact, Dolores, the most famous of Ziegfeld girls, never once smiled on-stage in her ten years with the Follies.

Most plant pollen is highly inflammable. It will ignite and explode when placed on an extremely hot surface. In the early days of modern theater, artificial lightning was produced by throwing pollen grains of the club moss onto a hot shovel.

Charles Didelot, a Frenchman, staged ballets in St. Petersburg and had a profound influence upon Russian ballet. In 1796, he devised a system whereby dancers could be lifted into the air on wires, giving the illusion of flight. By means of wires, Didelot could lower a ballerina to the floor so that she seemed poised on the tips of her toes. Ballerinas soon after learned to dance on their toes without wires.

The English indirectly owe the preservation of Shakespeare's birthplace to P. T. Barnum. In the 1850s, the Stratford-on-Avon cottage was neglected, and its living room was a butcher shop. When Barnum began to negotiate to acquire the house and ship it in pieces for display in his museum, the English were horrified and banded together to buy it; they made it a national monument.

When Maxwell Anderson wrote the play *Elizabeth the Queen* for Alfred Lunt and Lynn Fontanne in 1930, many revisions were necessary, but none were forthcoming. The Philadelphia run was a disaster. The next stop was Baltimore, where the play opened during a torrential rain. The next morning, Anderson finally showed up with the precious rewrites. He confessed that he could write only when it rained. In his Rockland County, New York home

he had a sprinkler system over his studio roof so he could have the sound of rain falling whenever he wanted it

In the 1920s and 1930s Charlie Chaplin was probably the most celebrated man in the world. On a visit to his native London, the motion-picture comedian received 73,000 letters in just two days.

In 1967 both Laurence Olivier and Peter Ustinov were nominated by the Television Academy for the same Emmy award. Olivier was not able to be present, so he requested that Ustinov should accept for him if he won. Ustinov was superstitious about preparing an acceptance speech in advance for himself, but he was prepared to accept for Olivier. It was Ustinov who won the award and, stammering and changing a word or sentence here and there, he used the Olivier speech for his own acceptance.

During the Elizabethan age, plays were usually printed without credit to the author. All of Christopher Marlowe's plays that were printed in his lifetime, for example, appeared anonymously. Only because of a casual reference by a fellow playwright two decades later is it known today that Thomas Kyd wrote *The Spanish Tragedy*.

Shakespeare never gave up acting while he was writing thirty-seven plays. It was his livelihood. He was one of the 'principal comedians' who acted in *Every Man in His Humour* by Ben Jonson in London in 1598. Two years after the first performance of *Hamlet*, his name appears on the list of 'principal tragedians' who acted in Jonson's *Sejanus*. Eight years before his death in 1616, Shakespeare was among the 'men players' who arranged to use the Blackfriars Theatre.

A U.S. television network's dramatic representation of the trial of Nazi judges was sponsored by the natural-gas industry. The word 'gas' was excised from the script, but a few 'gases' slipped by, those had to be bleeped by technicians before the program was broadcast.

The master of theater realism was the producer David Belasco. For *The Easiest Way*, in 1908, he bought the entire interior of a dilapidated boardinghouse — furniture, carpets, gas fixtures, and the faded wallpaper — and transferred it to the stage. In 1912, for a play entitled *The Governor's Lady*, Belasco bought the furnishings and equipment of a Child's restaurant for his set. He even had coffee brewed in the coffee urn so that the aroma would fill the theater.

In the early 1900s, Rector's was the most popular and fashionable after-theater dining place in New York. But in 1908, the heroine in the play *The Easiest Way* gave up trying to be virtuous and decided to return to a life of sin. The last line of the play was, 'I'm going back to Rector's to make a hit and to hell with the rest.' These words so shocked the public that Rector's business fell off, and five years later it was bankrupt.

Anyone who thinks that theater tickets are expensive today might consider what happened in 1854. That was the year the famous Academy of Music opened on New York's 14th Street. The prices ranged from $3 to $40 per seat.

The nineteenth-century New York theaters, with their gas lights and inflammable scenery, were prone to fires. One of every four theaters of this period burned within four years of being built. The Bowery Theater, which opened in 1826, was destroyed four times and rebuilt. Showman P. T.

Barnum was burned out of his theaters twice in three years; both times his valuable animals were incinerated or set loose on the streets. The greatest loss of human lives in a nineteenth century theater fire in New York resulted from the burning of the Brooklyn Theater in December 1876 during a performance of *The Two Orphans*. Firemen searching the ashes found 289 bodies—people from the gallery who had suffocated before they could escape. Many theaters, fortunately, burned down when they were empty.

Clare Booth Luce was not allowed by her husband Henry Luce, founder of Time Inc., to participate in the development and running of *Life* magazine, though she had created the concept. She turned instead to writing the Broadway play *The Women*. It ran for 657 performances on Broadway, was translated into twenty-six languages, and was twice made into a movie.

The fabled entertainer George M. Cohan not only produced, directed and starred in productions, but he wrote them as well. He did his writing at night, completing as many as 140 pages at a single sitting. He wrote songs for his musicals after he had written the books for his musicals. Someone else made the musical notations for him while he whistled such now famous melodies as 'Over There' and 'You're a Grand Old Flag.' If he couldn't get enough peace and quiet at home, he would go to the railroad station and hire a Pullman car drawing room on a train going far enough away for him to complete his work.

Alfred Lunt became very nervous if he played to a theater with any empty seats. He was really only happy with an audience that included standees. One night, during the run of *Idiot's Delight*, there were a few empty seats. So the playwright Russell Crouse got out a dummy that had been a prop in another play, dressed him, stood him up in the

back of the house, and told Lunt there were standees. Lunt was delighted, and told Crouse after the performance that 'one standee was so interested in the play that he hardly moved at all.'

Everyone has heard of Hollywood's voice-dubbing. In the movie musical *Singin' in the Rain*, the lesser art of foot-dubbing was applied. After Gene Kelly completed his famous tap dance in the rain, the director still needed the sound of sloshy tapping feet. Instead of having Mr. Kelly dance again for the sound track, two young ladies put on their tap shoes and, tapping in bucketsful of water, produced the required sounds to match the tapping seen on the screen. One of these tappers was the late Carol Haney, assistant to Mr. Kelly, and the other was Gwen Verdon, choreographer Jack Cole's assistant. Both of these foot-dubbers later became Broadway dancing stars.

Silent-movie superstar Mary Pickford was known as 'America's Sweetheart,' but she was adored all over the world. On her frequent trips abroad, she would be mobbed by hordes of overenthusiastic fans. In Paris, when she visited Les Halles, the open-air market, her fans became so threatening that two butchers had to lock her in a meat cage until the police could rescue her. Later, in Alexandria, Egypt, her car was nearly wrecked by stevedores who wanted her to autograph their ears so they could have the signature permanently tattooed.

Throughout her long and enormously successful career, Sarah Bernhardt never trusted any of her money to a bank. She insisted upon being paid in gold coins, which she carried with her in a battered chamois bag. From this bag she paid her company, servants, and creditors. When there were too many gold coins for the bag, she put the overflow in a chest under her bed.

The partisan supporters of the American actor Edwin Forrest and the British actor William Charles Macready clashed violently outside the Astor Place Opera House in New York in 1849 – Macready was playing *Macbeth* there – and twenty-two people were killed in the confrontation.

After months of discussion and planning, it took Richard Rodgers only five hours to compose the overture, the ballet music, and the songs for his first big Broadway musical hit with Oscar Hammerstein *Oklahoma!* The show tried out on the road under the title *Away We Go*.

In shooting the acclaimed film *The Lost Weekend* about an alcoholic, the outdoor filming was done in New York City and the interiors were done in Hollywood. The latter included an exact duplicate of a Third Avenue bar, P. J. Clarke's. On Stage Five at Paramount Pictures, Clarke's was reborn, complete to the dusty stuffed cat on the top of the telephone booth. Ray Milland, who starred in the film, tells that for one week every afternoon at five o'clock the door of the set would open, a man would walk up to the bar (whether filming was going on or not), order a straight bourbon, chat about the weather, plunk down fifty cents, and stroll out. It was the writer Robert Benchley, who was homesick for New York.

Florenz Ziegfeld got his first job in show business with Buffalo Bill. One of the features of the famous Wild West show was a shooting contest with the sharpshooter Annie Oakley. Buffalo Bill offered him a job, and Ziegfeld accepted without telling his parents. The job didn't last very long because the irate elder Ziegfelds brought their runaway boy back almost immediately.

During the pre-Broadway tour of the 1936 musical *Red, Hot and Blue!*, Cole Porter had to do a lot of rewriting

Rather than hire a professional stenographer to take his dictation and transcribe the changes, he used the services of one of the stars of the show – Ethel Merman. Before she went into show business, Miss Merman had been a secretary. Porter described her as 'among the best stenographers I ever had.'

When the Broadway musical *Annie Get Your Gun* was being produced, the production staff, including director Joshua Logan, decided that the leading man and leading lady needed one more duet. At a meeting they asked composer Irving Berlin to write it. When the meeting broke up, Mr. Logan went right home, and when he walked into the front door of his apartment the phone was ringing. It was, of course, Irving Berlin, who proceeded to sing the just-written 'Anything You Can Do, I Can Do Better.' Berlin had created the whole song, words and music, in the ten to fifteen minutes it took him to ride home in a cab.

The first motion picture copyrighted in the United States showed a man in the act of sneezing. (The year was 1894.)

Showman Florenz Ziegfeld believed in getting just what he wanted. When his show *Whoopee* was about to open in Pittsburgh, the star, Eddie Cantor, came down with laryngitis and was unable to speak. Ziegfeld found out that the best throat doctor in Pittsburgh was recovering from a near-fatal car accident. He stormed into the man's sickroom, gave him a check for $1,000, and had him put on a stretcher and into a waiting ambulance. Eddie Cantor sat on the floor of his hotel room while the doctor painted his throat and gave him other medication from the stretcher. The show opened as planned.

In 1957, Frank Sinatra was quoted as describing rock-and-roll as 'phony and false' and 'written and played for the

most part by cretinous goons.' But when Elvis Presley finished his army stint three or four years later, Sinatra paid him $125,000 to appear for six minutes on a television special.

Acting was once considered so frivolous an occupation that authorities in Virginia, in 1610, forbade the immigration of actors from England. Because of the evils that were thought to be associated with the craft, the cast of the first English play in colonial America in 1665 was arrested in Virginia, but acquitted. The play was *Ye Bare and Ye Cubb*, written and produced by three amateurs.

The usual technique of making a motion picture is to do it in short 'takes' lasting from five to fifteen seconds each. The film then is put together by splicing the takes. In filming *Rope*, Alfred Hitchcock made a unique experiment. He did the entire movie in a 'single shot.' It was not really a *single* shot, because each reel of film runs ten minutes and there was a pause at the end of each ten minutes to reload the camera. The pause was 'covered' by a closeup of someone's back or a table. The new take began at the point the previous one ended. When something went wrong during a ten minute segment, the scene had to be done over. When *Rope* was completed, there was no cutting required. The various reels had only to be spliced.

Julian Mitchell was the director most frequently used by Florenz Ziegfeld to stage his musical extravaganzas. He did his job brilliantly in spite of the fact that he was deaf. In order to judge the dancers' steps or calculate the rhythm of a scene, he would put his forehead or his ear to the piano to feel the tempo. One of the stars who worked for him, Hazel Dawn, remembered one time when a great thunderstorm had broken out while he was working with a chorus and he

complained, 'Why are you girls shuffling your feet?'

After becoming Emperor of Rome, Nero's dearest ambition was to sing in public, according to the Roman chronicler Suetonius. After taking lessons, he made his debut in Naples. An earth tremor shook the theater, causing some of the audience to depart while Nero continued singing. At a later performance elsewhere, he had the gates locked so no one could leave while he was on stage. Some women gave birth in the stands. Some men, tired out with listening and applauding, furtively leaped over the walls. Three clever citizens tricked the guards into letting them through an exit: one pretended to be dead and the other two carried him out.

All of Mary Pickford's success came from playing the roles of young girls (and occasionally young boys). Even though she was only five feet tall, the sets for her pictures were especially built to enhance her slightness. All furniture and props were scaled one third larger than life-size, doors and windows were bigger than normal, and doorknobs were placed higher.

During his career as an actor and light-opera singer, DeWolf Hopper recited 'Casey at the Bat' at least 10,000 times.

The stellar cataclysm in the motion picture *2001: A Space Odyssey* was filmed by Stanley Kubrick in an abandoned corset factory in New York City. The 'cataclysm' was a close-up of paint dripping in a bucket.

A tambourinelike instrument used in minstrel shows was made from the jawbone of a horse or ass - from which the

instrument got its name, 'bones.' When the bone was thoroughly dried, the teeth were so loose they rattled and produced a sound as loud as a castanet. Every minstrel troupe had a 'Mr. Bones.'

In the early days of silent films, there was blatant thievery. Unscrupulous film companies would steal a film print, reshoot a scene or two, and release it as a new production. But the Biograph company, to identify and protect its productions from piracy, put the initials AB (the company's trademark) somewhere in every scene - on a door, a wall, or window.

Sideshow performers in ancient Greece used to amaze their audiences by pressing a spot on a goat's neck - pinching off the artery leading to the brain - and causing it to go to sleep. Releasing the pressure would allow the goat to wake again. The trick still works today.

George S. Kaufman began his career as a newspaperman, going to work on *The New York Times* in September 1917. For most of his years on the *Times*, Kaufman was the drama critic, a job he continued to hold even when he became a successful playwright. The newspaper business seemed steadier to him than the fly-by-night life of the theater. He didn't resign from the *Times* until August 1930. In fact, he wrote twelve of his greatest hits while continuing his $80-a-week job on the *Times*.

There are songs in all of Shakespeare's plays except *The Comedy of Errors*. That play was the basis for a Broadway musical in 1938 that won the Pulitzer Prize. *The Boys from Syracuse*, by Richard Rodgers and Larry Hart.

Rin Tin Tin, for years the most famous dog in the world,

was born to a war-dog mother in a German trench in France during World War I. Deserted when the Germans retreated, the German shepherd puppy was found by an American officer who happened to be a police-dog trainer from California. He trained Rin Tin Tin when they returned home. The dog was so intelligent he came to the notice of Warner Brothers, which signed him up for what turned out to be a long career as one of the biggest box-office draws of the silent screen.

Cole Younger, a notorious Western outlaw, spent twenty-five years in a Minnesota jail, and emerged to say he was a changed man. He made a good income on the lecture circuit, attracting large audiences who came to hear him on 'What Life Has Taught Me'. He said it had taught him to be good.

Cat's cradle is one of the most universal games in the world. It is played in almost every culture. What is somewhat a puzzle to ethnologists is that widely scattered peoples – Maoris of New Zealand, North American Indians, Arctic Eskimos, and Africans, for instance – make figures of string between their hands that are exactly the same.

Twenty years before the *Mayflower* dropped anchor off Cape Cod in 1620, Spanish explorers near present-day El Paso, Texas, put on a performance of a *comedia* dealing with an expedition of soldiers.

Elsa Maxwell was a unique phenomenon in the twentieth-century social world. Starting without beauty, money, or social connections, she made herself into the social arbiter-supreme. Her contacts with the wealthy and titled of the international set were so extensive that when the Waldorf

opened in New York in 1921 she was given a suite rent-
fr[illegible] Hotel [illegible] Miss Maxwell with a [illegible]

UNIVERSE

The universe is so vast in relation to the matter it contains that it can be compared with a building twenty miles long, twenty miles wide, and twenty miles high that contains only a single grain of sand

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The nearest star we know of that exploded as a supernova is the one that gave rise to the Gum Nebula (named for Colin Gum, an Australian astronomer who discovered it in 1950 At its peak, the star may have blazed as brightly as the full moon That was 11,000 years ago, however, and there were only Stone Age men to observe and admire it – or to be frightened.

The night sky may appear to be full of stars, but actually only about 3,000 stars are visible to the naked eye They can be seen without a telescope because they are either extremely luminous or relatively close to Earth The closest star to Earth, not counting the sun, is Alpha Centauri, which is at a distance of 4.3 light years, or 25 trillion miles.

All the stars comprising our galaxy, the Milky Way, revolve around the center of the galaxy once every 200 million years or so. At the distance at which our sun is located from the center, Earth and the rest of our solar system are moving at a speed of about 170 miles per second around the center.

The brightest star in historic times was the supernova of 1054, the Crab Nebula. It was far brighter than Venus It

was bright enough to be visible in daylight and to cast a shadow at night. We know of it through the astronomical records of China and Japan. No European seemed to have taken note of it at the time.

Cepheid stars vary in brightness in such a way that they can be used to measure the distance of very far-off objects. The first Cepheid was discovered by a nineteen-year-old named John Goodricke, in 1784. He died two years later. The youngest observer in astronomical history, Goodricke was a deaf-mute.

Photographs of galaxy M 82 showed it to be undergoing an enormous explosion in its core. Jets of hydrogen up to 1,000 light-years long were streaming outward in all directions. The explosion probably had been going on for 1.5 million years.

If all the atomic nuclei in the entire known universe were squashed together, it would make a ball small enough to fit inside our solar system. In fact, it would stretch out to the asteroid belt and still have all the mass of the entire universe.

The closest star to the sun, Alpha Centauri in the southern celestial hemisphere, is never visible in the sky north of about 30° Northern Latitude. Though it is the third-brightest star in the sky, it was not seen by the ancient Greeks nor by the chief observatories of the medieval Arabs at Cordova, Baghdad, and Damascus, all located north of the 30° line.

In the constellation Cygnus, there is a double star, one of whose components has such a high surface gravity that light cannot escape from it. It is Cygnus X-1, which many

astronomers believe to be the first 'black hole' to be detected.

The second-brightest star in the constellation Perseus dims and brightens quite perceptibly. Every two days and twenty-one hours, the star, Beta Persei, rapidly loses a full magnitude of brightness for a brief period, and then as rapidly regains the loss This cycle is the most notable variable among the naked-eye stars. It sometimes has been called the 'Demon Star,' a sign that something might have been considered to be wrong with it The Arabic name for the star is Algol, 'the Ghoul,' again indicating something chilling.

Carbon, hydrogen, nitrogen, and oxygen – the four basic elements that make up all but 1 percent of terrestrial matter – are also the basic elements of the stars of the Milky Way. Which is why George Wald, the Nobel Prize-winning professor at Harvard University, tells his students that if they learn their biochemistry here on Earth, they would be able to pass examinations on Arcturus as well. Life, consisting of common elements, after all, is likely to be fundamentally the same chemistry everywhere

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A massive star has a shorter lifetime than a less massive star. The more massive a star, the more tightly its gravity pulls it together, the hotter it must be to keep it from collapsing, and the more rapidly it uses up its hydrogen fuel The reason there are so few really massive stars is that they do not live very long, as little as a million years. For comparison, our sun has an expected lifetime of about 11 billion years.

A neutron star is so small and has such a powerful gravitational pull that it can turn on its axis in a second, or

even in a thirteenth of a second without tearing itself apart

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Though the effort proved negative, Project Ozma for three months in 1960 marked the first attempt by man to detect intelligent life in another world. The radio telescope at Green Bank in England tracked Epsilon Eridani and Tau Ceti for signals of intelligent origin.

The Greek philosopher Thales (624–546 B.C.) is the first man in history to ask the question 'Of what is the Universe made?' and to answer without introducing gods or demons. In later centuries, when the Greeks made up lists of the 'seven wise men,' Thales invariably was placed first.

The first pulsar (a celestial object that emits brief, sharp pulses of radio waves instead of the steady radiation associated with other natural sources), discovered in 1967, never varies in its timing by even as much as a hundred-millionth of a second. Its pulse is registered every 1.33730109 seconds.

Science is accustomed to puzzles. In 1669, a Dutch physician, Erasmus Bartholinus, discovered that a transparent crystal of Iceland spar split light into two parts, every line looked like a double line. It didn't fit the then-current theory of light as a stream of particles, and the effect remained a total puzzle for 139 years. A French physicist, Etienne L. Malus, finally solved the puzzle in terms of the new wave theory of light.

The diameter of the sphere of the observable universe – 25 billion light years – is nearly four times that thought correct as recently as three decades ago.

As late as 1820, the universe was thought by European scientists to be 6,000 years old It is now thought to be between 15 billion and 20 billion years old

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A 'shell' of TV and radio signals carrying old *Gangbusters* and *Lone Ranger* and *Howdy Doody* radio and television programs is expanding through the cosmos at the speed of light, sweeping past the stars.

UNITED STATES

The District of Columbia, which has a single non-voting seat in the House of Representatives, has a population (700,000) that is greater than that of any one of seven states: Alaska, Wyoming, North Dakota, South Dakota, Nevada, Delaware, and Vermont. The district also pays more in taxes than any one of eleven states.

In 1638, Sweden founded a colony in the New World: New Sweden, in the Delaware River Valley.

During the colonial period in North America, a package was not always shipped by the most direct route. A package from Virginia that was destined for Massachusetts might be shipped to London, where it would be transferred to an English vessel for delivery to Boston.

The 'American' log cabin got its start in Sweden, where such a building had been popularly used for centuries, and was taken to America by the Swedish colonizers of New Sweden, which is now Delaware.

Robert R. Livingston and James Monroe sailed for Paris for the sole purposes of buying a small piece of French-held land in the West - New Orleans - and for expanding waterway traffic. They ended up buying half a billion acres of wilderness, the Louisiana Purchase.

Because he had a free pass to ride the railroads, a former conductor, Edwin Drake, became the first man to sink a

well in the United States that struck oil (August 27, 1859). Because Drake's trip wouldn't cost them anything, a group of businessmen in New Haven, Connecticut, sent him to western Pennsylvania, where 'rock oil' – petroleum – had been found floating on ponds. Drake convinced an old salt driller, 'Uncle Billy' Smith, that because oil also was obtained when people bored for salt water, one should simply bore for the oil.

The population of New Hampshire increased only 8.3 percent between the start of the War of Independence and the 1970 census. In the same 194 years, the total population of the original thirteen states, which included New Hampshire, increased from 2,616,000 (estimated) to just under 75 million – a gain of 2,767 percent.

In the United States only eighty miles separate the highest point of land in the lower forty-eight states and the lowest point. Mount Whitney on the eastern border of Sequoia National Park in California is 14,496 feet high, and a pool called Badwater in Death Valley is 280 feet below sea level.

Until the late nineteenth century, there was no uniform system of timekeeping in the U.S. Time was determined locally except for railroad time, and each railroad had its own standard usually based on the local time of its headquarters city. There were at least seventy-five different railroad times. The resulting confusion and the growth of complex rail networks led Congress to call an international conference in Washington, D.C., in 1884, to establish a common prime meridian for regulating time worldwide. Greenwich in England was chosen as the prime meridian, and the world was divided into twenty-four time zones.

The name 'United States of America' was coined by a man

who lived the last years of his life in disrepute and whose bodily remains eventually were lost - Thomas Paine. Paine had lived his first forty-seven years in England mostly in poverty, and only a happenstance meeting in London with Benjamin Franklin encouraged his move to America. Later in 1776, he wrote his popular revolutionary tract, *Common Sense.*

Many American cities were equipped with electric lighting before Thomas Edison invented the incandescent lamp. A device known as the arc lamp, brighter and more glaring than Edison's bulb, had been invented in the early nineteenth century by Sir Humphry Davy. By the 1870s, it was in use in lighthouses, public buildings, and factories. The Edison bulb's softer glow made electricity more desirable. By 1885, most U.S. electric companies were switching to incandescent lighting.

The first nation to receive foreign aid from the United States was Venezuela. In 1812, Venezuela, fighting for its independence from Spain, suffered a severe and damaging earthquake. Congress appropriated $50,000 to help the victims.

Congress, in 1870, granted naturalization rights to whites and to people of African descent but not to Orientals. This law was confirmed by a Bureau of Immigration and Naturalization decree in 1911 and again by the Immigration Act of 1924, which stopped all immigration from Japan. It was only after Congress passed Public Law 414, in 1952 - granting Japanese aliens the right to become U.S. citizens - that the last regulations discriminating by race were abolished.

The first automobile to cross the U S took fifty-two days in 1903, to go from San Francisco to New York

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The U S in many ways does not measure up to its image of advanced medical care There are sixteen other countries, including all the Scandinavian countries, France, and Spain, in which a newborn baby has a better chance to survive the first year.

Morocco was the first country to recognize the United States (1789).

By law, the U S Census Bureau may not share information about an individual with any other federal agency, let alone with an outsider. As a result, the bureau refused to turn over to government authorities a list of all the names it had of individuals of Japanese origin when the U S. was rounding up persons of Japanese descent in California and herding them into internment camps after Pearl Harbor

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When Alaska and Hawaii became the forty-ninth and fiftieth states of the U S., their principal cities became the two most expensive cities in the nation in which a family can live 'comfortably.' According to the U S Department of Labor in 1978, it cost the average family $24,019 a year to live comfortably in Anchorage and $20,883 in Honolulu One of America's oldest cities, Boston, ranked as the third most expensive· $20,609. New York and northeast New Jersey were fourth· $19,972 Texas may be the millionaires' state, but two of its cities ranked among the least expensive cities for a family to live comfortably: Austin, $14,776; Dallas, $15,313.

It was an English chemist James Smithson ba tard son of a ord – whose bequ t ed to t e f ur ing of the Sm thsonian Institution in Wa ington, DC for the increase and diffu er of knowledge an ong men. No one knows why he selected the U S as the seat of h largesse. He had no acquaintances in Amer a and seemed to have only a co ple of books relating to Americ a. When Pres dent Andrew Jackson informed Congress that he had no authority to take steps toward ac pting Smithson' gift of $500,000, a tedious ten-year proceeding ens debat ensued. Senator John C Calhoun expressed the opinion that t was beneath dignity to receive presents from anyone. It took until August 1846 to establish the in t tion. Smithson's body, interred in Italy, was fetched and now rests in Washington.

The budget of the U S Department of Health, Education, and Welfare ($260-billion) is larger than the combined operating expenses of all the governments of the fifty U S states combined.

The U S has profited greatly twice at the hands of a nation that viewed Great Britain as the enemy. In 1803 France, aware it could not hang onto the vast Louisiana Territory, sold it to the U S at about 2 cents an acre rather than have it fall to Great Britain. In 1867, Russia sold the 586,400 square miles of Alaska to the U S at less than 2 cents an acre. The logical purchaser would have been Great Britain, whose dominions in Canada bordered the land on the east, but Russia considered Great Britain to be an enemy. Britain had won the Crimean War against the Russians and sided with the Confederacy in the U S Civil War.)

Most freed slaves remained in the South immediately after

Reconstruction, but some venturesome ones moved westward. About 40,000 black homesteaders began new lives on the plains of Kansas, Iowa, Nebraska, and Oklahoma in 1879.

After an act of Congress, in 1808, prohibited African slave trading, at least a quarter of a million more slaves were illicitly imported into the U.S.

Texas has 254 counties Alaska, which is more than twice as large, hasn't any.

Jews first came to America in 1624, when two Jewish men and one Jewish woman arrived in Virginia. On the eve of the Revolution about 1,500 Jews lived in the colonies but in none were they allowed to vote or to hold public office.

Mail-order frame houses were popular in the U S. in the mid-1850s. The exact-size boards, nails, etc., bought by catalog, were shipped mainly to the Far West. One hundred portable wooden houses were sent by pack mules across the Isthmus of Panama, then by ship to California. One hundred and seventy-five were sent around Cape Horn to the West Coast. In San Francisco, a three-and-a-half story hotel – a hundred rooms, ten shops – was similarly ordered and put up in a hurry.

Pennsylvania was named not after the Quaker William Penn, but after his father, Admiral William Penn. Charles II owed a large debt to Admiral Penn, whose son agreed to cancel the debt for a grant of land in America on the Delaware River The new proprietor was alluding to his

father when he called the grant 'Pennsylvania' – 'Penn's Woodland'

Among the memorable quotations of the 1920s are 'Public service is my motto' and 'I want peace and I'm willing to live and let live.' They were spoken by Al Capone when he was the most notorious public enemy in America and the most murderous of Chicago gangsters. He also said, 'The American system of our ... gives each and every one of us a great opportunity if we only seize it with both hands and make the most of it.' Arguing sharply against communism, Capone said, 'We must keep America whole and safe and unspoiled.'

In the U.S., about 48 billion metal cans, 26 billion bottles, 65 billion metal bottle caps, and seven million automobiles are junked each year.

Pornography is a $4 billion business in the U.S. annually.

Woodrow Wilson's Vice-President, Thomas Riley Marshall – who is credited with saying during a Senate debate on national needs that 'what the country really needs is a good five-cent cigar' – was the first man in nearly a century to serve a second term as Vice-President. In 1828, two-term John C. Calhoun became the only Vice President to serve under two Presidents – John Quincy Adams and Andrew Jackson. Calhoun later became the first Vice-President to resign.

The first operable gasoline-powered automobile in the United States – assembled by J. Frank and Charles E. Duryea – was still considered as such an oddity two years after its introduction in 1894 that it became a principal

attraction at the Barnum & Bailey circus, where it was displayed like some freak

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Beginning in 1882, immigrants had to pay to enter the United States. A tax of 50 cents per person was imposed that year; it was increased to $2 in 1903 and to $4 in 1907.

May 10, 1869, marked the completion of the first single-track transcontinental railway in the U.S. as well as the giveaway by Congress of 155 million acres to railway promoters and buccaneers. In addition to land, promoters received millions of dollars in U.S. subsidies and bonds. Some of these found their way into the pockets of the congressmen who had given them away.

Eskimos use refrigerators to keep food from freezing.

The United States has about 3,600,000 square miles of land, and on it more than 3,600,000 miles of highway have been constructed – a mile of road to each square mile of land. The paved area is as large as the state of West Virginia.

The U.S. state of Maine has 3,500 miles of coastline.

In 1813, Major George Armistead, commandant of Fort McHenry, placed an order for a flag 'so large that the British will have no difficulty in seeing it from a distance.' In fulfilling the commission for that flag, subsequently celebrated as 'Old Glory' and 'The Star-Spangled Banner,' Mary Pickersgill and members of her family sewed over 400 yards of bunting into a banner 30 by 42 feet, costing

$405.90. This was the flag that Francis Scott Key saw 'was still there.' It hangs today in the Smithsonian Institution.

There are half a million more automobiles in Los Angeles than there are people.

In the Old West, in the second half of the 1800s, nearly one cowboy in three was either Mexican or black. About one cowboy in six or seven was Mexican, a similar proportion was black. Most of the blacks had been slaves on Texas ranches, where they had been taught the skills of roping and riding.

The U.S. Automobile Association was formed in 1905 for the express purpose of providing 'scouts' who could warn motorists of hidden 'police traps.'

A community for the purpose of 'educating blacks for freedom' and to help make possible their resettlement outside the U.S. was established by Frances Wright and others on the Wolf River near Memphis, Tennessee, in 1825. Called Nashoba, it was unsuccessful due to poor management and hostility of outsiders. It was abandoned within five years.

A century and a half ago in the United States, all postal rates were determined not by weight but by the distance the mail had to travel. During the period 1825-38 the rates were 6 cents for a trip up to 30 miles, 10 cents for 30 to 80 miles, 12½ cents for 80 to 100 miles, 18¾ cents for 150 to 400 miles, and 25 cents over 400 miles. Today, most U.S. mail rates are related only to weight. A few categories such

as second class (magazines) and fourth class (packages) have rates based on weight and zones (distance shipped).

Every year, dirt costs the United States $4.9 billion. That is the estimate by the U.S. Council for Environmental Quality of the damage to vegetation and the works of man caused by airborne dirt.

Nearly 43 percent of convicted criminals serving prison sentences in the U.S. are rearrested within a year of being released from prison.

A replica of the head and the torch of the Statue of Liberty sat on the grounds of the Philadelphia Exposition celebrating the U.S. centennial in 1876, and later in Madison Square on lower Fifth Avenue in New York. (The statue itself, a gift from France, was delayed by the Franco-Prussian War.) A decade passed before funds were raised for the erection of the statue on Bedloe's Island, now called Liberty Island, in New York Harbor.

The American Colonization Society was formed, in 1816, by the Reverend Robert Finley of New Jersey, for the purpose of establishing in Africa a colony to which the 200,000 U.S. blacks freed by slaveholders or born to free parents could be sent. Prominent slaveholders like Calhoun, Clay, Randolph, and Jackson supported the Society because they feared the threat to slavery posed by free blacks. Congress was persuaded to lend aid for land purchases. In all, about 15,000 blacks left America for the colony, which came to be called Liberia. The capital is named Monrovia, for President James Monroe.

Four states have active volcanoes: Washington, California, Alaska, and Hawaii, whose Mauna Loa is the world's largest active volcano. Hawaii itself was formed by the activity of undersea volcanoes.

The U.S. has had three different names. It was known as "The Congress" until the Articles of Confederation was ratified in 1781. Under the Articles, the U.S. was then called "The United States in Congress Assembled." Under the present Constitution, the country is known as "The United States of America."

Two Americans, John Reed and William Haywood, are buried in the Kremlin. John Reed wrote the book *Ten Days That Shook the World* (1919), considered the best eye-witness account of the Russian Revolution. Big Bill Haywood, an American labor leader, was one of the organizers of the Industrial Workers of the World. When the U.S. entered World War I, Haywood was arrested for sedition and tried, convicted, and sentenced. He jumped bail in 1921 and fled to Russia, where he died.

Half of the people of the U.S. live in just eight of the fifty states: in Pennsylvania, Massachusetts, Michigan, California, Illinois, Ohio, New Jersey, and New York.

No one seemed to know for certain at the time what the U.S. had bought in the Louisiana Purchase. The details of the boundaries were not clear, and much of the territory was unknown and unexplored. The purchase turned out to total 883,072 square miles, or 565,166,080 acres, which is seven times larger than England, Scotland, and Ireland combined. It was also larger than the combined areas of

France, Germany, Italy, Spain, and Portugal.

The Pony Express, which has lived in legend for more than a century lived in fact for less than two years. Indian raids curtailed service on the 1,966-mile route between St. Joseph, Missouri, and Sacramento, California, and the transcontinental telegraph finally obviated it in late 1861.

To avoid speculation in rarities, the U.S. Post Office intentionally printed 10 million defective stamps honoring the late U.N. Secretary-General Dag Hammarskjold after a printing error was discovered in the original fifty-stamp pane.

In the United States there are over 100,000 labor-union officers, elected democratically every year, in the 115 national unions that comprise the AFL-CIO. About 450,000 general membership meetings of unions are held annually.

In 1978, more than a thousand deer were accidentaly killed in Connecticut by automobile drivers. Only 948 were killed by hunters.

The official manual of the Internal Revenue Service of the U.S. is an agglomeration of 38,000 pages. It has appropriately been described as 'the world's most confusing publication.'

Although the first permanent English settlements in the United States were established on the east coast, the Spaniards' Palace of the Governors in Santa Fe, N.M.,

built in 1610 is the oldest public building still standing in the United States.

There were several threats of secession by states of the U.S. before the Civil War in 1798, when Federalist efforts to control criticism of the government caused Jefferson and Madison to formulate the Kentucky and Virginia Resolutions that developed the states' rights position later used as justification for nullification and secession. In 1812 when the Federalists opposed the war and New England threatened secession, in 1832 when South Carolina promulgated an Ordinance of Nullification in a contest over a protective tariff.

A copy of the U.S. Constitution was burned in 1854, on the Fourth of July, by the main speaker at a public demonstration in Boston. In denouncing slavery he said the Constitution was 'blood-stained ... a covenant with death and an agreement with hell ... a compromise with tyranny.' The speaker was William Lloyd Garrison, the abolitionist. Eventually, the Constitution was amended.

The Bill of Rights barely received the necessary votes in 1791 to be ratified as part of the U.S. Constitution; approval of three-quarters of the fourteen states was needed, and only the eleven required votes were obtained. The last three of the fourteen states that belonged to the United States at that time – Georgia, Massachusetts, and Connecticut – did not ratify the Bill of Rights until its 150th anniversary in 1941.

The first department store that opened in the United States is still in operation. It is the Zion's Co-operative Mercan-

tile Institution, founded by Brigham Young in Salt Lake City in 1868.

So outraged were Bostonians that the U.S. military (army and navy) in 1854 had forced the return of the slave Anthony Burns to his Southern master, that a fund was raised for the purchase of Burns and he was then set free. The U S had spent at least $100,000 in extraditing Burns.

Though the U.S has less than 6 percent of the world's population, its share in the consumption of the world's resources amounts to nearly 60 percent

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Congressman Thaddeus Stevens was so dedicated to helping the newly emancipated blacks achieve rights and economic aid after the Civil War that when he was dying he ordered that he be buried in a cemetery among blacks so that even in death he might demonstrate his devotion to equality.

When Vice-President Spiro Agnew resigned his office in 1973, he was not the first Vice-President to do so, although he was the first to be compelled to do so John C Calhoun, Andrew Jackson's Vice-President, resigned in 1832 so he could be named senator for South Carolina This move made it possible for Calhoun to lead the fight of the Southern states for states' rights and the doctrine of nullification.

There have been communist settlements in the U.S. The followers of Etienne Cabet founded several Cabet (1788–1856, was a French utopian socialist who, when exiled from France in 1834, went to England where he developed his

form of communism in his famous book *Voyage en Icarie* (1840). He came to the U S and his disciples founded several colonies. Icaria, founded in Corning, Iowa, in the year of Cabet's demise, survived until 1898. Other settlements were shorter lived.

The state of South Carolina voted to secede from the United States more than a quarter of a century before it actually did so, in 1861. After the reelection of Andrew Jackson as President in 1832, the state legislature voted to leave the Union if the U S continued to collect tariff. But when Jackson prepared for a civil war, South Carolina backed down and rescinded its vote.

The first draft-card burners were members of the International Workers of the World, during World War I. The I W W was the first great working-class American protest movement, flourishing from 1905 to 1925. Nicknamed the Wobblies, they fought for the poor, the hungry, the downtrodden, and the dispossessed. They set the pattern for sit-ins and other types of demonstrations that were utilized by civil-rights groups and war protesters half a century later. Leaders of the Wobblies were intellectuals and Marxists, poets and singers. They gave America such songs as 'Casey Jones,' 'Dump the Bosses off Your Back,' and 'Solidarity Forever.' They failed in their aims – overthrow of the capitalistic system – but they created a new awareness of the right to protest.

The first 'dude-ranch' trip took place in May 1843 when the West was still 'wild.' A column of riders, pack mules, and covered wagons filled with tents, India-rubber boats, costly wines, potted meats, jams, and other expensive food and gear headed west across the Missouri plains. About forty young American sportsmen, including doctors, law-

yers, businessmen, and scientists, signed up for a summer of fun and hunting in the greatest wilds of all, the Rocky Mountains. Sir William Drummond Stuart, a Scottish nobleman, was the organizer and leader of the 'sporting expedition to the West.' Besides hunting and fishing, the 'sportsmen' went exploring and held horse races with the Indians, while the guides did all the necessary chores.

The coastline of Alaska is longer than the entire coastline of the lower forty-eight states of the United States.

When the U.S. was sixty years old in 1836, Narcissa Prentiss Whitman and Eliza Hart Spalding were perhaps the first women to cross the continent. They reached Oregon that year in a party organized by the American Board of Commissioners for Foreign Missionaries. The success of the expedition stimulated emigration to the territories in the Northwest.

U.S. CIVIL WAR

During the Civil War, the Confederate army had all the cotton it needed for uniforms, but no opium to kill the pain of the wounded. The Union Army had plenty of opium, but no cotton. Throughout the war, North and South exchanged opium and cotton. President Lincoln had been authorized to trade with the South when it would be of benefit to the Union.

Robert E. Lee, general-in-chief of the Confederate armies that fought to maintain the institution of slavery in the U.S., freed his own slaves, having found that 'slavery is a moral and political evil in any society, a greater evil to the white man than the black.'

The Emancipation Proclamation, President Abraham Lincoln's executive order dated January 1, 1863, abolishing slavery in the Confederate States of America was probably not legal according to U.S. civil law. To remedy any deficiencies in the proclamation's legal status, the Thirteenth Amendment to the Constitution was introduced in Congress in 1864 and ratified in 1865. It abolished slavery or involuntary servitude in the United States or anywhere under U.S. jurisdiction. The Proclamation had had little impact, for Lincoln had no authority in the Confederacy.

Richmond-born Elizabeth Van Lew was sent to private school in Philadelphia, where she became an abolitionist and persuaded her father to free the family's fifteen slaves. One of the slaves was sent to Philadelphia to be educated. When the Civil War broke out, the former slave returned

to work as a servant in the home of Confederate President Jefferson Davis, gathering valuable information for the Union Army.

Furious at Great Britain's support of the Confederacy during the U.S. Civil War, many Americans wanted Canada as reparation. But Canada was a self-governing British dominion, and it became difficult to argue its annexation to pay a British debt. The U.S. demanded $2 billion, and eventually settled for $15.5 million, which the British paid in full within a year. The situation was known as the *Alabama* reparations claim. The ship *Alabama* and other Confederate privateers had been outfitted and supported by Great Britain.

At the mere nod of his head, Jefferson Davis could have had a senatorial seat after President Andrew Johnson's Christmas 1868 amnesty had put an end to Davis's treason trial. But the erstwhile president of the Confederacy refused to accept citizenship or to enter the government again (he had been Secretary of War and a Senator from Mississippi). He was given a hero's funeral when he died in New Orleans in 1889.

The vindictive U.S. Secretary of War Simon Cameron made sure that no one would again want to live in Robert E. Lee's house south of Washington, D.C. Soldiers' graves were dug close to the house, and the area later was confiscated. Today, the site is the national military cemetery at Arlington, Virginia.

Barbara Fritchie, whose reported heroism in facing down General 'Stonewall' Jackson and his Confederate army marching through Frederick, Maryland, in 1862, was celebrated in John Greenleaf Whittier's widely popular ballad, probably never met or even saw the Confederate

general. She was ninety-five years old and bedridden when she supposedly protested the dragging of the Union flag in the dust. "Shoot if you must this old gray head, but spare your country's flag," she said. The ballad was popular with Southerners as well, for the chivalry of the dedicated general was noted by Whittier. "Who touches a hair of yon gray head, dies like a dog. March on," he said. Jackson was killed in the war, and Barbara died before the ballad achieved national circulation and they could attest to its authenticity.

Confusion reigned during one of the first major battles of the U.S. Civil War because the Union and Confederate flags were similar in appearance. At the Battle of Bull Run, in the spring of '61, the Union flew the Stars and Stripes and the Confederacy flew a flag with seven stars and three stripes. The Confederacy quickly adopted a new pennant.

More than 3,000 Union soldiers were quartered in the U.S. Capitol when they were stationed in Washington to defend the city during the Civil War.

Henry Morton Stanley — who later became famous for saying "Dr. Livingstone, I presume?" — fought in the U.S. Civil War, on both sides. In 1856, he had moved from Great Britain to New Orleans, the home of his adoptive father. He enlisted, at the age of twenty-one, in the Confederate Army, was captured after a year's service, and imprisoned. In exchange for his release, Stanley agreed to join the federal artillery. After being discharged because of poor health, he served impressively as a ship's writer in the federal navy.

Major General Leonidas Polk, who led Confederate troops in the Mississippi Valley during the Civil War, was the Episcopal bishop of Louisiana when Jefferson Davis

appointed him to the command. An 1827 graduate of West Point, Polk had resigned from the army to study for the ministry.

Long-term idealism won over short-term advantage in Britain's response to the U.S. Civil War. The British did not side openly with the Confederacy, though the ruling classes would have liked to, if only to weaken the U.S. and throw the Americas all the more open to British exploitation. Oddly, the textile workers in England, who were thrown out of work when the factories shut down for lack of cotton, rallied in great demonstrations against the very Confederacy that could have put them back to work. The reason for the workers' protest: they disapproved of slavery.

Civil War general William Tecumseh Sherman, renowned for the most controversial campaign of that war, the devastating Union army sweep through Georgia in 1864, the 'march to the sea,' had been superintendent of a new military academy in Louisiana now Louisiana State University from 1859 to 1861. When Louisiana seceded in January 1861, Sherman resigned, despite his love for the South and its people, and was commissioned a Union infantry colonel.

A woman, Elizabeth Van Lew, was rated by General Grant as his most efficient secret agent during the Civil War. Known as 'Crazy Bet,' this supposedly demented daughter of a well-to-do Richmond merchant passed information to Union commanders and arranged daring prison escapes for Union soldiers, hiding the fugitives in a secret room in her mansion overlooking the James River.

Only once during the Civil War, at the Battle of Nashville,

December 15 16, 1864, did a Union commander win a total victory over a major Confederate army ending its usefulness for the rest of the war That officer was General George Henry Thomas who also was one of only fifteen Union officers voted the thanks of Congress for war service.

In April, 1865, with the Civil War over, thousands of Union soldiers were gathered at Vicksburg on the flooded Mississippi waiting to be sent home Among them were soldiers freed from Southern prison camps The men were so eager to get home that when the steamboat *Sultana* landed at Vicksburg, the soldiers jammed aboard the ship, 2,360 men squeezed into a space meant to carry 376 The boat putted upstream against a strong current, and was further slowed by defective boilers About three days later, at two in the morning, the boilers exploded and the ship caught fire and sank Seventeen hundred men died in one of the worst steamship accidents

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In England, there are about 500 Civil War buffs who congregate in the countryside on weekends, divide up into regiments - Union and Confederate - and reenact the battles of Shiloh, Chickamauga, Gettysburg, etc

The U S Civil War broke out on April 9 1861, but the first soldier did not die in battle until six weeks later The combatants made up for the slow start In four years, up to 700,000 men were killed

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President Jefferson Davis, in a message to the Confederacy in November 1864, urged that 40,000 slaves be purchased outright and enlisted into the army; after the war, they would be given their freedom

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Senator Andrew Johnson of Tennessee, who had also served as governor, maintained an unswerving pro-Union stand in Congress during the Civil War crisis. He was the only senator from a seceding state to remain in the Senate over the protests and vilification of his constituents. (Lincoln made him governor of the reconquered Tennessee in 1862 and his vice-presidential partner in the election of '64.)

To stave off the Civil War, Senator John J. Crittenden of Kentucky proposed, unsuccessfully, that the country be divided along the old Missouri Compromise line (the southern boundary of Missouri), with slavery forever barred in any territory north of it and forever guaranteed against federal action in any territory south of it. When war erupted, one of the Senator's sons became a general for the Union and another became a general for the Confederacy.

'There is Jackson, standing like a stone wall!' said Bernard Elliott Bee about Confederate general Thomas Jonathan Jackson at the First Battle of Bull Run, in 1861. Bee was later killed in the battle, and 'Stonewall' Jackson, as he was everafter known, was killed accidentally by fire from his own troops after routing the federal right wing at Chancellorsville, in 1863.

Troops returning from Gettysburg restored order in the New York City draft riots of 1863, but by then 1,200 people had been killed.

The Confederate soldier who pulled the lanyard that fired the first shot of the war at Fort Sumter – Edmund Ruffin – committed suicide after the Confederacy had surrendered at Appomattox.

Raphael Semmes, who had resigned his commander's commission in the U S Navy to serve in the Confederate Navy as captain of the *Alabama*, sank or captured more than eighty Union vessels from 1861 to 1864

In the 1850s, Ulysses S Grant, under pressure of allegations of intemperate drinking, resigned his U S Army commission He farmed and worked as a clerk in his father's leather store in Illinois He later led the Union Army to victory in the Civil War

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Before he accepted command of the Confederate Army in the U S Civil War, General Robert E Lee had turned down a similar offer to command the Union Army

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Less than 25 percent of the white U S population were members of the slaveholding planter class in the old South The 1860 census records show that under 400,000 heads of households were listed as owning slaves Assuming five persons in each of their families, the class as a whole was much smaller than usually believed only 2 million people Nonslaveholders were generally small farmers, artisans, tradesmen, and poor whites Usually, they were more anti-black than the slaveholders If they didn't keep the blacks at the bottom of the heap, they themselves would have been there In turn, the house blacks – the slave aristocracy – despised the 'poor white trash')

The first time that an enormous amount of clothing was needed all at once was during the Civil War, when the Union needed hundreds of thousands of uniforms for its troops Out of this need came the ready-made-clothing industry.

The first battle of the Civil War was also the quickest and most bloodless battle of the war. Major Robert Anderson surrendered Fort Sumter in the harbor of Charleston to Confederate General P. G. T. Beauregard, who had fought for the U.S. alongside Anderson in the Mexican War. In the day-and-a-half siege, no one was even wounded.

Robert E. Lee was a superintendent of West Point but had never commanded in battle when he became commander of the Confederacy's Army of Northern Virginia during the Civil War.

Confederate officers were allowed, after Appomattox, to keep their swords - the symbols of honor - and officers and troops were allowed to keep their horses so they could use them back home to help in planting crops. 'This will have a very happy effect upon my army,' General Robert E. Lee said on learning of the Union's decision.

The first fatalities in the Civil War did not occur on the battlefield. Four members of the Massachusetts militia were stoned to death by a Baltimore mob of Confederate sympathizers, on April 19, 1861.

The reputed creator of baseball, Abner Doubleday, is celebrated for another reason: he aimed the first Union defense shot from Fort Sumter, in the harbor of Charleston, South Carolina, in the exchange that ignited the Civil War. A West Point graduate, Doubleday served as a Union general through the war.

During the Civil War, George Washington's home at Mount Vernon, Virginia, was treated as neutral territory by

arrangement between the Union and the Confederacy. No armed soldiers invaded the house.

When Union general William Rosecrans and Confederate general Braxton Bragg met at Murfreesboro during the Civil War, each adopted the same tactics, holding his right in place and wheeling in a flanking maneuver to the left. They thus exchanged places on the battlefield and confronted each other again, but in opposite directions. The Battle of Murfreesboro was an indecisive as this maneuver.

Abraham Lincoln and Jefferson Davis were inconspicuous officers in the Black Hawk Indian War of 1832. Thirty years later, they were commanders-in-chief – Lincoln of the Union Army against Davis of the Confederacy during the U.S. Civil War.

Giuseppe Garibaldi, hero of Italian national unification, was asked twice by President Lincoln to head a Union army in the U.S. Civil War. Garibaldi had two conditions: that he be made commander-in-chief and that the abolition of slavery be made an official goal of the war. Lincoln was not ready in 1861 to agree with the goal, and, according to the Constitution, only the President can be commander-in-chief.

Just before the Civil War, the Republican Party led Congress in passing a proposed amendment to the Constitution that would have denied the federal government the power to abolish or interfere with slavery in those states in which it already existed. The measure was sent to the states for ratification, in March 1861, with the approval of newly

inaugurated President Lincoln. Three states had ratified it when the outbreak of the war made the amendment meaningless.

WEATHER

New Hampshire's Mount Washington, which is only 6,288 feet in altitude, is often considered to have the worst weather in the world. Its severe combination of wind, storm, cold, and icing is the result of its location where two storm tracks meet, one from the Arctic and the other from the tropics. The highest wind velocity ever recorded on Earth – 231 miles per hour – swept across the summit of Mount Washington in April 1934. More than thirty people have died there as a result of sudden changes in the weather.

It is said that no two snowflakes are identical, but all snow crystals can be classified into seven basic shape categories. Most recognizable as a typical snowflake is the six pointed star, other common shapes are the column, the needle, and the hexagon. Each crystal's individual shape is determined by the temperature and humidity of the air in which it is formed.

In living memory it was not until February 18, 1979, that snow fell on the Sahara. A half-hour storm in southern Algeria stopped traffic. But within a few hours all the snow had melted.

Lightning strikes the Earth a hundred times every second, from the 1,800 thunderstorms in progress at any given moment.

Continental snow cover would advance to the equator, and the oceans would eventually freeze, if there were a

permanent drop of just 1.6 to 2 percent in energy reaching the Earth

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In 1816, there was no summer in many areas of the world In parts of New England, snow stayed on the ground all year Crops there and in Europe were ruined Volcanic dust from the eruption of Tomboro in Indonesia that blocked the rays of the sun has been blamed for the unusual weather as well as for the red and brown snow that fell in the United States, Hungary, and Italy.

Most grandfather clocks with metal pendulums lose time in warm weather This phenomenon occurs because most solids expand when heated In the case of the clock, the higher temperature makes the metal pendulum longer, and thus slower.

An average of 140 tornadoes occurs every year in the United States But there were a record 90 in one day alone, in a region extending from Ohio to Georgia, in the spring of 1974.

Lightning is more likely than not to strike twice in the same place Like all electric currents or discharges, lightning follows the path of least resistance

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Because air is denser in cold weather, a wind of the same speed exerts 25 percent more force during the winter than it does during the summer.

Due to friction with the surface of the planet, the wind retards or accelerates the spin of the Earth very slightly A peak in the seasonal slowing of the planet is most evident during the northern winter

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Seventeen and one half inches in circumference and 1 67 pounds in weight that's the size of the largest hailstone known to have fallen in the U S It struck during a severe storm at Coffeyville, Kansas, in September 1970

The fastest temperature change on record is a rise of 49° F in two minutes, from -4° to 45° F in Spearfish, South Dakota, January 22, 1943 between 7 30 and 7 32 A M

Lightning kills more people in the United States than any other natural disaster an average of 400 dead and 1,000 injured yearly.

Weather hazards (rainstorms and snowstorms, floods, tornadoes, hurricanes, etc cost the U S $5 6 billion in property damage and over 1,000 lives annually

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The chinook, a wind phenomenon that occurs over Montana in the U S and Alberta in Canada, is capable of raising the temperature more than 30° F in three minutes Damp sea air from the Pacific Ocean drops rain and snow as it passes over the Rockies The dry air then tumbles down the eastern slopes, becoming compressed as it does so, and, as a consequence, incredibly hot One February, the temperature in Calgary rose from -14° to 76° F

The Sahara is not the perpetual oven of baking sand, as many believe It has the typical continental climate of alternating hot and cold seasons Its high temperatures range up to the 136 4° F (58° C. recorded at Al Aziziyah, Libya, and as low as 5° F (—15° C in the Tibesti mountains in midwinter

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Gigantic snowfalls may be crippling to big cities, but at

least in New York City they have a tendency to fall mainly on the days most convenient for the urban population. A study of the biggest snows in the last sixty-eight years shows that 54 percent of them fall on Friday or Sunday, when the cleanup can be accomplished with minimum inconvenience to those millions who must go to work and school. According to the law of averages, only 28.6 percent should have fallen on these two days.

A person working in downtown Manhattan will have 16 percent more rain than his family at home on Long Island. He will also be drenched by more thunderstorms. Rainfall is greater in this inner city than in the surrounding suburban area because of pollution factors in the city. Another example of how man's treatment of the environment affects the weather is found in La Porte, Indiana, a town downwind from the industrial Gary-Chicago area. It gets 246 percent more rain than the surrounding area because of the pollution blowing its way.

In 1755, Benjamin Franklin pursued a small tornado for three-fourths of a mile on horseback, repeatedly lashing out with his whip in an effort to dissipate the storm.

The date of June 2, 1953, was selected for the coronation of Queen Elizabeth II because meteorologists said it was the most consistently sunny day in the calendar. However, the weather is no respecter of royalty and, of course, it rained.

Though 25,000 surface weather observations are made every day around the world, though there are 10,000 land stations and 6,700 ships with weather-measuring equipment, and though more than 1,000 daily measurements of winds and temperatures in the air are made from balloons,

no more than 20 percent of the globe is considered adequately covered.

Rain contains vitamin B_{12}.

The behavior of certain animals can be successfully used in weather prediction. Fiddler crabs have been seen burrowing inland two days before a hurricane. In the northwestern United States, foresters have sometimes predicted snow by observing elks, which gather beneath sheltering trees two or three days before a blizzard.

Observations of increased rain after U. S. Civil War battles led to abortive experiments with weather control. Cannon volleys were fired into clouds in order to induce rain.

When the hot wind called *sharav* arrives twice a year in Israel, there are marked increases in restlessness and irritability among people and animals. The ionic balance of the atmosphere apparently changes with the arrival of the 'ill wind,' and excess positive ions are trapped at ground level. The effect on humans of excess positive ions is an increase in serotonin, one of the body's neurotransmitter substances. Excessive serotonin is known to make a person nervous, irritable, and depressed.

On June 10, 1958, a tornado was crashing through El Dorado, Kansas. The storm pulled a woman out of her house and carried her sixty feet away. She landed, relatively unharmed, next to a phonograph record titled 'Stormy Weather.'

Nearly 100 pollution-filled, weather-beaten years in New York have done more damage to Cleopatra's Needle – a

granite obelisk covered with hieroglyphics – than did 3,500 arid years in Egypt.

Residents in a small village in Scotland schedule their television viewing according to the tides. At low tide, the nearby mud flats absorb the broadcast 'waves.'

With the information received from 3,000 U S. weather stations, a computer performs 10 billion arithmetical operations in printing out the twenty-four-hour national weather forecast. It is estimated that a hundred-day forecast would require a trillion arithmetical operations

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WHAT A WAY TO GO

Archduke Francis Ferdinand of Austria was an extremely vain man. When he went to a great occasion, he had himself sewn into his uniform so there would not be a single crease to mar his appearance. Unfortunately, the Archduke was wearing one of his sewn-on uniforms when he was shot in Sarajevo, on June 28, 1914. It was impossible to unbutton his uniform. By the time scissors were found, the Archduke had died to death.

In 1911, a suburban tailor named Teichelt, who had invented a batwing cape that he believed would enable him to fly, applied for permission to fly from the Eiffel Tower. The proprietors of the tower reluctantly gave permission, provided that Teichelt obtain police authorization and that he sign a waiver absolving the tower proprietors. Incredibly, the police gave permission. At eight o'clock, on a cold December morning, Teichelt – accompanied by a handful of well-wishers and press photographers – climbed to the level of the first platform, stepped over the edge, and plunged to his death.

When the 'mad monk' Rasputin was assassinated in Petrograd (Leningrad), in 1916, his assassins first fed him cakes and wine laced with enough cyanide to kill several men. Rasputin ate and drank, and showed no ill effects. Then Prince Felix Yussupov shot him through the chest and clubbed him on the head with a lead-filled walking stick, and the conspirators threw him into the Neva River. When the body was recovered, the autopsy revealed that Rasputin had drowned.

As a young man, Maximilien Robespierre opposed the death penalty, giving up the opportunity for a brilliant legal career because he had scruples about serving in a court that sentenced condemned persons to the scaffold. But on gaining control of the French Revolution, in 1793, Robespierre launched the Reign of Terror that sent hundreds to the guillotine – before he himself died beneath its blade.

The Donatists of fourth-century North Africa were so committed to the idea of martyrdom that they would stop strangers and demand to be killed by them. Since the strangers were threatened with death if they refused, the Donatists found martyrdom easy enough to come by.

The city morgue in the Bronx, New York, has been so busy at times that next of kin take numbers – as in a corner bakery shop – and wait in line for their body-identification call.

At the Pan-American Exposition in Buffalo, in 1901, President William McKinley received a line of citizens, shaking hands with each. In the line was a man with a handkerchief covering one hand. Neither of the two Secret Service men guarding the President was curious enough to take a look at what might be under the handkerchief in the hand of the man – Leon Czolgosz, an anarchist. What he had was a loaded revolver, and when the President thrust his right hand out for the shake, Czolgosz fired twice. McKinley died a week later.

About 13,700,000 people died in battle during World War I. The year-long influenza epidemic that followed killed even more. At least a billion people were ill and at least 20 million died.

Through the door and the windows, would-be assassins pour seventy three bullets into Leon Trotsky's bedroom in the fortress like house in Mexico City. Thanks to a moment's warning, Trotsky and his wife escape unscathed by hiding under their bed. Later in the year, which was 1940, Trotsky was slain by one man using an ice pick who had wormed himself into the confidence of the old Russian revolutionist. The assassin went by the alias Jacques van den Dresched, but his true identity remains unknown.

How many of us at the moment of death will have the composure to say something memorable and impeccably phrased? And what will motivate us? French revolutionist Georges Jacques Danton may have been conceited or just bitter when he said, under the guillotine, 'Be sure you show my head to the mob. It will be a long time before they see its like.' Nero's case was clearly conceit. *Qualis artifex pereo* — roughly, 'What an artist the world is losing!' Sir Walter Raleigh, feeling the edge of the ax, mused matter-of-factly, 'Tis a sharp remedy, but a sure one for all ills,' as did Anne Boleyn when she said, 'The executioner is, I believe, very expert, and my neck is very slender.' Louis XVI may have been forgiving rather than sarcastic when he said, on the scaffold, 'May my blood cement your happiness.' The deaf Beethoven must have welcomed a better world with the words 'I shall hear in heaven.' Denis Diderot was philosopher to the end. 'The first step toward philosophy is incredulity.'

The story of the Temple Mound Indians of the Mississippi Valley, known for their extensive archaeological remains, is a mystery. At the height of their cultural achievement, around the sixteenth century, they developed an apocalyptic death cult, and before the invading Spanish could

conquer them, their entire society had died out. No satisfactory explanation for their disappearance has been found.

The chief theme of Joseph Conrad's novels is the demoralizing effect of isolation. Conrad's personal experiences were the basis for this. While the Polish-born Joseph (1857–1924) was still young, for instance, his mother voluntarily became a political prisoner so the family could accompany Joseph's father in exile. It took three months to make the coach trip from Poland to Siberia.

The greatest funeral for a gangster ever held in Chicago was for a flower shop entrepreneur named O'Banion. The shop, at the corner of State and Superior Streets, was a front for O'Banion's bootlegging and hijacking operations. Ten thousand mourners were in attendance, and the most expensive wreath – it cost $1,000 – came from Al Capone, who had ordered that O'Banion be rubbed out.

The sheriff of Bannack, in the Idaho Territory (now Montana), and the most-wanted outlaw in the area were one and the same man. Henry Plummer kept the peace by day and led a gang of bandits and murderers by night. In January 1864, vigilantes captured the gang, and Plummer was hanged.

Someone maliciously shouted 'Fire' at a copper miners' Christmas party in Calumet, Michigan, in 1913. Panic ensued and seventy-two lives – mostly children's – were lost.

In London in 1812 a gambler having lost his money and his clothes staked his life on the next roll of the dice. He lost again, and agreed to let the winner hang him. When rescued from the rope by a passerby, the gambler was incensed because he held to the code that a gambling debt should be paid.

The British abolition of the death penalty was triggered by a case in which the star witness was a mass murderer. John Christie in 1950 testified that John Evans had killed his own wife and son, and Evans, despite his insistence that he was innocent, went to the gallows. In 1953, it was discovered that it was Christie who had killed a number of people, including probably the Evanses. Christie was tried and executed. The revelation that an innocent man, Evans, might have been hanged caused such revulsion against executions that Parliament voted to end them.

The most ancient report of a solar eclipse is in Chinese records. The eclipse came without warning, according to legend, because the royal astronomers, Hsi and Ho, were too drunk to make the necessary computations. They were executed — the only astronomers known to have been killed for dereliction of duty.

One of the most atrocious murders of the nineteenth century was committed by a Harvard professor. When Dr. John Webster of the medical school owed Dr. George Parkman a large sum of money, he killed Parkman and dismembered him, hiding the parts in a well. A suspicious janitor opened the well and found them. Webster was tried and executed.

On August 12, 1895, Minnie Dean became the first woman to be hanged in New Zealand. Her crime was 'baby farming.' She would adopt unwanted babies for a certain fee and then dispose of them, a 'service' she began in 1889. The police caught on to Minnie after six years and found her to be most certainly guilty when they dug up three bodies of infants in her flower garden

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'Thugs' were originally religious mystics of India Banded together in a secret society, and devoted to the sinister goddess Kali, they performed countless ritual murders by twisting a rope around the victim's neck. The society was broken up in the nineteenth century.

In winter, gravediggers in Siberia pour kerosene over the frozen ground and set it afire. When the kerosene burns off, they dig away the layer of thawed soil They then pour more kerosene, burn it, and dig some more They keep this up until the ground has been pried open enough to accept a coffin.

From the 1850s to the 1880s, the most common reason for death among cowboys in the American West was being dragged by a horse while caught in the stirrups

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Pierre Belon (1517–64), a French naturalist, wandered all over the hostile shores of the eastern Mediterranean, where Christians were not exactly welcome in those days, studying plant and animal life. He came through it all without a scratch Back in Paris, he went to the Bois de Boulogne to gather herbs and was waylaid by robbers and killed.

A common taboo is that royal blood should not be spilled on the ground. When Kublai Khan defeated his uncle Nyan, he ordered him placed in a carpet and tossed to and fro until he died. In 1688, the king of Siam executed a kinsman by having him placed in a large mortar and pounded to death with a pestle so that no blood would touch the ground.

Having survived a barrel ride over Niagara Falls that broke 'nearly every bone' in his body, in 1911, Bobby Leech embarked on a lecture tour around the world. In New Zealand, he slipped on a banana peel and died of complications' from the fall.

Medical treatment, during the seventeenth and eighteenth centuries, was aimed at ridding the sick of 'vile humours' by vomiting, purging, and bleeding. The treatment was often the immediate cause of death. Some prescriptions called for 'letting' more blood than is now known to exist in the whole body.

The Sui, who ruled China briefly, around 600 A.D., devoted much of their reign to constructing the Grand Canal, a waterway 100 feet wide, lined with roads and trees, and stretching for 1,000 miles. The canal was completed in less than twenty-five years, at a terrible cost in human life. Almost 5.5 million people were involved in the construction, and it has been estimated that 2.5 million died due to the harshness of the working conditions. The canal, extending from Peking to Hangchow, is as navigable today as when it was built almost 1,400 years ago.

The English sociologist Herbert Spencer was a Darwinian

who proceeded to discredit the Darwinian view among people who felt kindness, pity, and mercy to be virtues. Arguing the theory of 'survival of the fittest,' Spencer declared that people who were unemployable or burdens on society should be allowed to die rather than be made objects of help and charity.

In early America, death was often the most public and most dignified event in an individual's life. It was considered important to 'die well,' surrounded by friends, neighbors, and relatives – witnesses to last words and wishes, which would be treasured as sacred

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Every four or five years the Malagasy of the Indian Ocean island of Madagascar, off southeast Africa, retrieve their dead from tombs that are half above ground and half below, expose them to the sunlight, toss them and catch them, and then wrap them in a new silk for reinterment It is called *famadihana*, and it is a time of much celebration, with singing and dancing

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Parsis, the religious community of India that stresses education and practices Zoroastrianism, believes that the sooner the dead body is picked clean of flesh, the sooner the spirit will be released Parsee dead are placed on platforms – towers of silence – where they are ravaged quickly by vultures.

In seventeenth-century Russia, the Great Schism (the Raskol) left the dissenting religious group (the Raskolniki) in such despair that many of its members sought death rather than wait for the end of the world they had predicted would occur before the end of the century

Between 1672 and 1691, there were thirty-seven mass immolations in which more than 20,000 Raskolniks voluntarily burned to death. They had thought it senseless to remain on Earth and risk being contaminated by heresy.

After Spartacus's gladiatorial revolt had been suppressed in 71 B.C., no less than 6,000 recaptured slaves were crucified on miles of crosses all along Rome's main highway, the Appian Way.

The Greek city-state Thebes had suffered for four years under the Spartan yoke when a small party of Theban men dressed as women and joined a drinking party the Spartan commanders were giving. The 'women' drew their knives and slaughtered their hosts, and the Spartans gave up the territory about 379 B.C. — the Trojan horse by another name.

In early England, suicides were interred in unconsecrated ground on the north side of the churchyards or at the crossroads with a stake driven through their bodies to keep them from rising and haunting the neighborhood. The latter practice did not end until 1823, when a murderer and suicide was staked and buried in St. John's Wood. Thereafter, such interments were forbidden by law.

Hatto II, archbishop of Mainz, Germany, was said to have found a unique solution to the great famine of 914 A.D. According to the chroniclers, he gathered in a barn at Caub a large number of the exceedingly poor and oppressed, under the pretext of feeding them there, once the crowd was inside, he set fire to the structure. His rationale: If the poor were sent to their heavenly reward, the famine would cease sooner. Years later, Hatto may have gotten his just

reward – he was said to have been eaten alive by hordes of mice

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There was an apocalyptic manner about the most intellectual of the fathers of the American revolution, James Otis (1725-83), who inspired the Committees of Correspondence (These committees were set up to collect and dispense information to kindred souls throughout the colonies Otis's views were the basis for continuing attacks upon acts of Parliament that regulated colonial commerce and taxation) He wished, in his later years, that he would die in a truly unexpected, heaven sent way, and he did – He was killed by a bolt of lightning

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The greatest disaster in circus history occurred in Hartford, Connecticut, on July 6, 1944, when fire swept through the Big Top. A total of 168 men, women, and children died in the fire, and nearly 600 were injured At the moment when the fire broke out, the audience was watching the performance of the Flying Wallendas. Disaster seemed to stalk this high-wire-performing family. In January 1962, while performing in Detroit, Michigan, a fall from the high wire resulted in two dead and one critically injured The tragic Wallenda story ended in March 1978 when the patriarch and founder of the act fell to his death while walking a high wire in a high wind in San Juan, Puerto Rico

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In a number of cultures – among Indians of Central America, the Thracians of antiquity, and others – when a child was born, its family sat around wailing over the woes the child must endure, ticking off every calamity that could befall humankind But when death occurred, the survivors laughed and joked on behalf of the deceased, whom they saw as departing for eternal bliss Sometimes a favorite wife

or consort was slain so she could share her loved one's paradise.

Every day in the U.S. about a hundred people over the age of fourteen commit suicide, a [illegible] per cent [illegible] in the last decade.

Burns are second only to traffic accidents as the cause of accidental loss of life in the U.S., about [illegible] a year.

Twenty-one people were killed by a wave of molasses in Boston, Massachusetts, in 1919. Over [illegible] gallons of melted sugar, weighing 13,500 tons, had been stored in a tank in the harbor. The tank ruptured for reasons never fully determined, and the wave, cresting at fifty feet, swallowed entire buildings.

Louis XVI and Marie Antoinette might have escaped from France in 1791 except for a delay to change coach horses at Sainte-Menehould. The King and Queen got out of the coach to wait, and were recognized. Two horsemen who rode ahead to Varennes gave the alarm that caused the fugitives to be stopped and returned to Paris — and eventually to the guillotine.

The French chemist Eugene Chevreul was born in 1786 and died in 1889 at the age of nearly 103. No other important scientist has lived to such an age. He remained active into his nineties, when he studied what we now call gerontology, the science of old age, using himself as a subject.

Stephen Decatur, U S. naval hero of the Tripoli campaign and of the War of 1812, was challenged in 1820 to a duel by a fellow officer, Commodore James Barron, who was nearsighted. To accommodate his opponent, Decatur agreed to exchange shots at only eight paces. Barron killed him.

It's dangerous being a critic. The great French chemist Antoine-Laurent Lavoisier turned down a chemical treatise as worthless. The writer was a lawyer named Jean-Paul Marat. Marat later was one of the influential radicals of the French revolutionaries, and he saw to it that Lavoisier was made increasingly unpopular. In 1794, Lavoisier was guillotined. When pleas were made that such a distinguished scientist should be saved, the presiding judge declared, "The Republic has no need for men of science."

Some scientists really are absent-minded. The great French physicist André Marie Ampère (an important contributor to electrical theory, 'amperes' are still the unit of current flow) was invited to have dinner with the Emperor Napoleon; Ampère forgot and never showed up. Maybe Ampere's absent-mindedness had something to do with the sadness of his private life, his father was guillotined in the French Revolution, his wife, with whom he was deeply in love, died after they had been married only a few years. When Ampère was dying, in 1836, he chose the inscription to be placed on his tombstone. It was *Tandem felix* – 'Happy at last.'

Nearly half of us die within three months after our last birthday, according to a study conducted by a Brigham Young University sociologist, Philip R. Kunz. Following up on a random sampling of 747 obituaries published in Salt Lake City during 1975, Kunz found that 46 percent of the deaths came within three months after a birthday and 77

per cent during the first six month. Only 8 per cent came during the three months [illegible] was [illegible] look forward to [illegible] following a birthday is [illegible] and can lead to depression and loss of the will to [illegible]

Francis Bacon (1561–1626), the Elizabethan champion of the scientific method, died in pursuit of a better way of preserving food. He had caught a severe cold while attempting to preserve a chicken by [illegible] with snow.

A great philologist was executed for murder in 1759. Eugene Aram had proved that Latin was not descended from Greek, and that Celtic belonged to the Indo-European language system. Unable to make a living from his scholarship, he murdered Daniel Clark – possibly with money as a motive, possibly because Clark had seduced his wife – and paid for the crime on the scaffold.

Henry Cavendish, one of the great scientists of the 1700s, was painfully shy and could barely speak to one person, never to two. He was so afraid of shy, or something, as the presence of women that he communicated with his female servants by notes only. If one crossed his path in his house, she was fired on the spot. He built a separate entrance to his house so he could come and go without meeting anyone. In the end he insisted on dying alone.

In 1705, John Smith, a condemned robber, fell through the drop at London's Tyburn gallows, and dangled at the end of the rope for about fifteen minutes. Suddenly a courier came galloping up with a reprieve. The hanged man was cut down, found to be still breathing, and resuscitated. He lived for some

years after that, and was called 'Half-hanged Smith.'

Robert Goddard was the father of the space age, having launched the first liquid-fuel rocket in 1926, from an aunt's farm in Worcester, Massachusetts, and developed a general theory of rocket action When captured German rocketeers were brought to the U S after World War II and were questioned about rocketry and its development, they asked with incredulity why the U.S. didn't already have the answers from Goddard The U S had to admit that it had neglected Goddard He died in 1945 before the neglect could be corrected and ergo, before the U S could benefit.

The terrible toll (more than 50,000 deaths) attributable to automobile accidents in the U S each year is accepted or ignored, but one airplane crash with 100 deaths makes headlines.

During their first winter in the New World – and a rugged winter it was - the Pilgrims secretly buried their dead in Cole's Hill in Plymouth The reason for the secrecy· The Pilgrims did not want the Indians to know how much the settlement had shrunk in population.

George Eastman (1854 1932) was born poor and had little chance for schooling Thanks to the profit of the company he founded, Eastman Kodak, he was able to contribute over $100 million to various educational institutions. Eastman committed suicide rather than spend his last years in loneliness and without the prospect of further accomplishment.

Though the charges of atheism and treason and corruption of young people were justified in a sense, Socrates would have been acquitted at his trial in 399 B.C. if he had made the least attempt to defend himself rationally. He deliberately goaded the jury of 500 men until they voted the death sentence in spite of themselves, and even then the majority was small, 280 to 220. 'The gadfly of Athens' spent a month between sentence and execution, refusing to escape, although escape could easily have been arranged. He had always been far more interested in the right code of behavior, in understanding the workings of virtue rather than of the heavenly bodies. When he drank the poison hemlock, Socrates believed that in his seventy years he had lived a good life. Most people have agreed with him.

William Walker, a proslavery American adventurer, 'colonized' Nicaragua in 1855, was 'elected' president there a year later, and was recognized by U.S. President Franklin Pierce, who had vacillated between recognition and the probability of antagonizing Great Britain. Walker was shot by a firing squad in Honduras in 1860 before he could carry out his plan to conquer central America.

Robert Cavelier La Salle (1643–87) really put in the mileage for France. Exploring North America, he traveled the whole of the Mississippi to the Gulf of Mexico (claiming the entire valley for France), traveled the whole of the Mississippi all the way back to Quebec, sailed back home for refinancing, sailed to the New World again, landing by mistake on the Texas coast instead of in the Mississippi delta, walked thousands of miles looking for the Mississippi, then sailed for Canada, got lost, storm-buffeted, and found himself back in the Gulf of Mexico. Such was the long-drawn-out weariness of the mission that on the third unsuccessful attempt La Salle's men mutinied against more hardship and murdered him.

The first martyr to science of whom we know was the Roman scholar Pliny the Elder. He was in charge of the Roman home fleet, stationed near the Bay of Naples in 79 A.D., when Vesuvius erupted and buried the towns of Pompeii and Herculaneum. In his eagerness to observe the eruption, Pliny went ashore. By delaying his leaving, he was trapped and was killed.

In 1885, Louis Pasteur saved the life of a nine-year-old boy, Joseph Meister, who had been bitten by a mad dog. It was one of the most famous medical triumphs. Fifty-five years later, in 1940, Meister was gatekeeper of the Pasteur Institute. When the Nazis captured Paris, a Nazi officer ordered Meister to open Pasteur's crypt. Rather than do so, Meister killed himself.

Charles Byrne was born in 1761 in Littlebridge, a town in Ireland. He grew to over seven feet in height as a result of a tumor on his pituitary gland. A surgeon, John Hunter, wanted Byrne's body for his museum and at one point offered him a large sum of money. Byrne was frightened at the idea of dissection after death and refused. Hunter hired a fellow by the name of Hewison to follow Byrne everywhere. When Byrne died of tuberculosis, in 1783, Hewison was right there to bribe a guard at the undertaker's. The final price settled on was £500, supposedly the most ever paid for a body.

Mithradates (c. 131–63 B.C.), the great king of Pontus and enemy of Rome, is said to have swallowed toxic substances systematically, increasing the doses until he made himself immune from assassination by poison. Ironically, when he was defeated and cornered by the Romans, he tried to commit suicide by poison, only to find that it had no effect. He had to get a soldier to kill him with a sword.

Joe Hill (1879-1915) Swedish-American union organizer, radical, folksong writer, and now legendary hero, was executed by firing squad after being tried and found guilty (on circumstantial frame-up evidence) of murdering a Salt Lake City, Utah, man. Thirty thousand people attended his funeral in Chicago. On the following May Day, his ashes were scattered in every state (except Utah) and many countries.

True heroes are indeed rare. Unique is Edith Stein, who went to her death in Auschwitz wearing the Star of David on her nun's habit, after offering herself as a sacrifice in an effort to save others. She was born into a German Jewish family in 1891, became assistant to the philosopher Edmund Husserl in 1916, converted to Catholicism in 1922 and took her vows as a Carmelite nun twelve years later, and wrote philosophical works and taught at German universities. When the Nazis rounded up Jews for extermination, Edith Stein proudly identified herself as Christian *and* Jewish, and in 1942 was gassed. Twenty years after her death, the Vatican began the formal canonization procedure for Sr. Teresia Benedicta a Cruce (the name she took) - which would make her the first 'Jewish Catholic' saint of our time.

Kepler calculated that the first voyages to the moon would take four hours, and thought that the passengers, in order to endure the trip, would take narcotics.

Alexander Graham Bell devised a metal locating tool to help find the assassin's bullet in President James Garfield in 1881. The device was workable, but didn't work on this occasion because no one had thought of removing the steel-springed mattress on which the President was lying. The metal, it turned out, interfered with the search. The unsanitary methods used in attempting to locate the bullet caused infection to spread through Garfield's body and resulted in his death.

Prince Borghese drove an Itala from Peking to Paris in 1907. During the trip, a defunct tire had to be replaced, and it was by a wooden wheel fashioned by a *muzhik*, a Russian peasant.

Suttee – the immolation of a widow on her husband's funeral pyre – existed in India as a pious custom for centuries. Thousands of women 'volunteered' to be burned every year. In the nineteenth century, the British imposed stiff penalties for those who participated in the rite, and eventually suppressed it.

WHAT'S IN A NAME

The Marquis de Lafayette, who fought with the forces of George Washington during the Revolutionary War, and his wife had the same first name: Marie.

Count Rumford (1753–1814), who was the first to develop the modern theory of heat, was born in the American colonies (Woburn, Massachusetts), but was a Tory during the Revolutionary War and sided for the British, reaching the rank of lieutenant colonel in the British army. He left with the British forces and spent the rest of his life in Europe. In 1791, he was made a count of the Holy Roman Empire. He chose his title from the name of the town, Rumford (later Concord), New Hampshire, where his wife was born. He did not entirely forget his native land. When he died in 1814, while Great Britain was fighting a second war with the now-independent United States, he left most of his estate to the U.S. and endowed a professorship in applied science at Harvard.

The U.S. nickname 'Uncle Sam' was derived from 'Uncle Sam' Wilson, a meat inspector in Troy, New York. During the War of 1812, Wilson's 'U.S.' stamped on meat barrels prepared for the U.S. Army was interpreted by some workmen to stand for their boss, 'Uncle Sam,' and the legend grew. (In newspaper cartoons during the Civil War, the figure of Uncle Sam took on the appearance of President Lincoln.)

Michael Faraday (1791–1867), whose discovery of electromagnetic induction led to the development of electrical

machinery for industry, refused a knighthood. He declared, 'I must remain plain Michael Faraday to the last.'

During his career, Vladimir Ilyich Ulyanov employed at least 151 pseudonyms. The best-known was Lenin (1870–1924).

The palace where the king of Egypt lived was the *per-o*, 'the big house.' When the Egyptians began referring to the king by his place of residence, 'pharaoh' – for *per-o* came into the language. It is as though Jimmy Carter were called 'whitey' for White House.

The most common name in the world is neither Ching nor John. It's Muhammad.

A common American coin, the nickel, is named for the Devil. It is so called because it contains the metal nickel, which was called that by German miners of the 1700s because it interfered with the smelting of copper. They called it *Kupfernickel* – 'copper Devil,' or 'Devil's copper.' (We still speak of the Devil as 'Old Nick.') A related metal, cobalt, presented similar trouble, and the German miners got the name from the earth spirit *Kobold* because it was thought cobalt was copper that had been bewitched.

The original name for the United Nations was 'Associated Powers.' Prime Minister Winston Churchill effected the change to 'United Nations' by quoting Lord Byron to President Roosevelt:

'Millions of tongues record thee, and anew
Their children's lips shall echo them, and say –
"Here, where the sword united nations drew,
Our countrymen were warring on that day."
And this is much, and all which will not pass away.'

A book of maps is called an atlas because the innovative sixteenth-century Flemish geographer Gerardus Mercator's book of maps detailing various portions of Europe sported on its cover a picture of the Greek titan Atlas holding the world on his shoulders — and this book became known as the atlas.

By the time he was eight, Carolus Linnaeus (1707–78) had gained the affectionate nickname of 'the little botanist'. He went on to classify living things in a particularly methodical way. For example, he gave the human species the name of *Homo sapiens*, thinking man, though he confined this classification to man's body alone. He considered man's soul to be outside the animal kingdom. Linnaeus's interest in sex led to a curious by-product. He was the first to use the Mars and Venus symbols for 'male' and 'female'.

Assassins originally were members of a secret order, a Muslim sect, in Persia and Syria. Their leader, called the Old Man of the Mountain, would serve them opium, later confused with 'hashish' which became 'assassin', and then dispatch the men to kill his enemies. They were given the 'hashish' and treated to great sensual pleasures. It was supposed to be a sampling of the pleasures of Paradise, where they would go if they died while performing their duties. The assassinations stopped after the Mongols stormed the sect's Alamut base in Persia, in 1256, and killed most of the Persian branch of the sect. But the sect, however, continued. Its leader today is the Aga Khan.

The male Maya Indian would change his name twice as he was growing up. His original name was linked with the date he was born. He would get a new name, describing a personal feature, when he was initiated into manhood. On marrying, he would take on his formal name.

The name 'Inca' originally did not refer to a race or to a nation of people. When Francisco Pizarro landed in South America in 1532, 'the Inca' meant king or ruler, and by extension one of his ancestors or relatives

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The Colosseum received its name not for its size, but for a colossal statue of Nero that stood close by, placed there after the destruction of his palace

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Natives of Papua, New Guinea, who deposit their money in the bank at Port Moresby don't get numbered accounts. Instead, they are identified by the names of fish and birds or other natural objects. One bank customer is called 'sawfish' for instance; another, 'hornbill.' Each depositor keeps his symbol secret.

Some of the names by which Bangkok is known are Great City of Angels, the Supreme Warehouse of Divine Jewels, the Great Land Unconquerable, the Grand and Prominent World, the Royal and Delightful Capital City Full of Nine-fold Gems, the Highest Royal Dwelling and Grand Palace, the Divine Shelter and Living Place of the Reincarnated One . . . .

The original name of Los Angeles was El Pueblo de Nuestra Senora la Reina de los Angeles de Porciuncula - 'The Village of Our Lady the Queen of the Angels of "Little Portion."'

Before Charles de Gaulle's death in 1970, French families were not free to choose any name they wished for their children. The ministry of the interior, in charge of licenses and records, kept a list of names of both sexes, and given names had to be chosen from that list

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A bicycle racer earned his nickname of Charles 'Mile-a-Minute' Murphy after proving he could pedal a mile a minute if wind resistance was eliminated. A smooth board track was laid between rails of the Long Island Rail Road, a hood was attached to the end of a passenger car, and on June 30, 1899, Murphy pedaled a measured mile behind the moving car in 57⅘ seconds – faster than any automobile at the time.

In the eighteenth century, wealthy visitors so thoroughly enjoyed the mineral springs and baths in the fashionable watering town of Spa in the Ardennes in southeast Belgium, near the German border, that the name of the town soon became a lowercase English noun.

The *Mayflower*'s Pilgrim Fathers didn't realize they were Pilgrim Fathers for another five decades, or until William Bradford wrote of the Plymouth plantation: 'They knew they were pilgrims.' Because of this phrase, first printed in 1669, the hearty band that landed on wintery Cape Cod in 1620 are now called Pilgrim Fathers.

Four of the chemical elements are named after a hamlet of Ytterby near Stockholm. The elements are erbium, terbium, yttrium, and ytterbium – the minerals containing them were located in Ytterby. In contrast, France, Germany, Russia, and the United States have one element apiece named in their honor. They are francium, germanium, ruthenium, and americium. Great Britain has none.

About 1,500 years after they occupied parts of Spain, the Vandals, a German tribe, are still present in name: the region in the south known as Andalusia is merely 'Vandalusia' with the initial letter missing.

The Ghana of today is not the same Ghana of yesteryear Today's Ghana was once the Gold Coast, on the Gulf of Guinea in West Africa Ancient Ghana was situated between and to the north of the Senegal and Niger rivers and to the west of Timbuktu. The word 'ghana' was a title meaning 'war chief,' and the area got its name from Africans from the north who would trade with 'ghana ' Ancient Ghana lasted around 1,000 years, until about 1240 A D , when it crumbled and disappeared

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When Adolf Hitler was in power in Germany, policemen and farmers were not allowed to call their horses by the name 'Adolf.'

'To Oslerize' became a byword in newspaper columns, letters, and cartoons when the Canadian physician Sir William Osler (1849–1919) delivered his valedictory address at Johns Hopkins University in Baltimore. He said, 'My . . fixed idea is the uselessness of men above sixty years of age, and the incalculable benefit it would be in commercial, political, and in professional life, if as a matter of course, men stopped work at this age ' One periodical headlined its story, 'Osler Recommends Chloroform at Sixty.'

Although some 200,000 surnames are used in Sweden, fully 40 percent of the population share just twenty of them, all ending in 'son.' Johansson is the most common name. The Swedish government urges people with the most common names to change them It has worked out a computerized list of Swedish-sounding words and urges name changers to adopt new names drawn from combinations of those for natural objects Among the popular names in use are Bergkvist ('rock-twig', and Malmstrom ('ore-river') Names adopted from towns or railroad stations are forbidden

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There are at least 2.4 million people in the U.S. named Smith, and over 1.8 million named Johnson and over 1.6 million named Williams or Williamson and over 1 million named Brown, and over 1.3 million named Jones. Keeping up with the Joneses would appear to be easier than keeping up with the Smiths.

In 1935, 'Iran' became the new name for what had been Persia, which was the new name for what had earlier been Iran.

In ancient Rome, there were fewer than twenty first names for males, among them Gaius, Marcus, Quintus, Lucius and Decimus. For that reason, people were further identified by two additional names denoting their gens or clan and family. For example, Caesar's full name was Gaius Julius of the Julian clan Caesar of the Caesar family.

WOMEN'S RIGHTS

Although colleges for women had been established in the United States as early as 1819, the first women's colleges to give an education comparable with that in the best men's schools were Vassar Female College (Now Vassar College), chartered in Poughkeepsie, New York, in 1861, Wellesley, near Boston, Massachusetts, in 1870, Smith College, Northampton, Massachusetts, in 1871, and Bryn Mawr, Philadelphia, Pennsylvania, in 1880. The first coeducational college to offer the same education to women as to men was Oberlin College, Ohio, which granted the bachelor's degree to three women in 1841.

When Jane Addams (1860-1935), the American social worker and reformer, wrote her entry for *Who's Who*, she proudly listed 'Garbage Collector' among her chief achievements. A corrupt Chicago bureaucracy was endangering the health of the slum people by failing to pick up the garbage, so the 'Lady of Hull House' assumed the responsibility herself.

To prove that girls could master such subjects as mathematics and philosophy without detracting from their health or charm, Emma Hart Willard founded the Troy (New York) Female Seminary, in 1821.

For founding a birth control clinic, in 1917, Margaret Sanger was jailed for a month in a workhouse.

Not until 1932 was a woman elected to the Senate. She was

Hattie Caraway, Arkansas Democrat. The first appointed woman Senator was Rebecca Felton, a Georgia Democrat, in 1922.

Dorothea Dix, the nineteenth century educator and first superintendent of U.S. Army nurses, recommended as nurses only women who were strong and not too good looking.

No woman held a Presidential cabinet position until 1933 when Frances Perkins became secretary of labor. She served a dozen years. Before her appointment in Washington, Miss Perkins was industrial commissioner for New York State.

Epicurus, 341-241 B.C., to whom good and pleasure were synonymous, was the first important philosopher to accept women as students.

Mercy Otis Warren, 1728-1814, at a time when women rarely played any part in public life, became a propagandist for the U.S. revolutionary cause, a confidante of John Adams, and an admired ally of most of the Massachusetts rebel leaders. She was a pioneer feminist who argued that women's alleged weaknesses were due simply to inferior education.

For several years, in the small town of Tweed, Ontario, there was a council consisting solely of women. This was the only known such case of female leadership in North America. In 1978, several men ran for office in Tweed solely on the basis of their gender, and one was elected.

In rain forests near the border of Brazil and Venezuela, the

Yanomamo tribe had a unique practice: Until a woman gave birth to a son, she killed her female infants, and she could do away with *all* unwanted children, regardless of sex, once the first son was born.

To the Athenians of the Golden Age, women were inferior creatures, only dubiously superior to domesticated animals, and with nothing in the way of human rights. To these cultivated Athenians, it seemed virtually self-evident that male homosexuality was the highest form of life, because that was the only way in which a male could love an equal.

At a time when the education of girls in most prominent families was concentrated on needlework, music, dancing, and languages, Aaron Burr insisted that his daughter, Theodosia, learn serious subjects rather than ornamental ones "to convince the world what neither sex appears to believe — that women have souls."

In seventeenth- and eighteenth-century America, women were employed in all of the same occupations that men were, and men and women earned equal pay. A female blacksmith charged the same as a man to shoe a horse. Women sextons and printers were paid the same rate as men. Women were silversmiths, gunsmiths, shipwrights, and undertakers.

Along the east coast of America, Indian women's councils could veto a declaration of war by refusing to supply moccasins and field rations. The decision whether to kill a captive or adopt him into the tribe was always made by women.

While women have often fought alongside their men, the only authenticated Amazon army was the fighting women

of the West African kingdom of Dahomey. Formed into an army by King Agaja in the early eighteenth century and trained into a ferocious fighting force by King Ghezo a century later, they were eventually crushed by the French in 1892. But for nearly two centuries the fighting women of Dahomey had been feared by the neighboring kingdoms. The army numbered about 2,500 – all were the wives of the king – and carried bows and arrows, blunderbusses and other firearms. Their huge knives were well known. Their main strategy was surprise. Effective as they were in warfare, they kined only in self-defense.

Margaret Brent (ca. 1600-ca. 1671) was an early American feminist. She went to Maryland from England in 1638, and was the first woman in Maryland to hold land in her own right. She served as agent to Lord Baltimore, and, under the will of Governor Leonard Calvert, was made executor of his estates.

The first woman governor in U.S. history was Mrs. Nellie Taylor Ross. She was elected governor of Wyoming in 1925.

The only male speaker at the first women's rights convention in Seneca Falls, New York, in the summer of 1848, was Frederick Douglass, former slave, abolitionist editor, and spokesman for American blacks. Men who supported the feminist movement were called 'Aunt Nancy Men,' meaning mamby-pambys and worse.

The first woman governor in the New World was Isabel De Soto, who acted as governor of Cuba from 1539 to 1542 in

the absence of her husband, the Spanish explorer Hernando De Soto.

The constitution of the state of New Jersey, adopted in 1776, gave property-owning women (only widows and spinsters could own property) the right to vote in state elections. However, voting by ineligible females – that is, young girls and married women – and, in the election scandal of 1806, by men in drag led to 'election reform.' In 1807, all women were disenfranchised.

A woman agreed in 1952 to play in organized baseball, with the Harrisburg, Pennsylvania, Senators of the Interstate League. However, minor league commissioner George Trautman, with the support of major league baseball commissioner Ford Frick, unilaterally voided Mrs. Eleanor Engle's contract.

The Territory of Wyoming allowed women to vote in territorial elections in 1869. When the territory became a state, in 1890, women's suffrage was written into the constitution so that women could vote in local and state elections. (They still could not vote in a national election.) Colorado allowed women's suffrage as early as 1893, Utah and Idaho, in 1896.

At the turn of the century, one-third of all the U.S. states – there were then only forty-five – did not allow wives to claim their own earnings, and one-quarter of the states denied wives the right to own property.

In 1781, a black woman, Elizabeth Freeman, who had been a slave in Massachusetts for thirty or forty years, was struck

on the arm with a hot poker as she was defending her sister from their mistress's wrath. She ran away. In Great Barrington, her master sued for her return and lost the case, which was decided on the basis of the Bill of Rights to the Massachusetts constitution holding that all men were born equal.

Ten thousand dollars was offered by Marion Hovey, of Boston, to the Harvard Medical School, to be used to educate women on equal terms with men. A committee approved the proposal, but the Hovey offer was rejected by the board of overseers. The year was 1878.

Though she was a Nobel Prize winner (and soon would become the first person to win two), Marie Curie (1867–1934) was denied membership in the august French Academy simply because she was a woman.

Belva Ann Lockwood (1830–1917) ran for President as the candidate of the Equal Rights Party in 1884 and again in 1888 – at a time when women could not vote in a national election. As the first woman to practice law before the Supreme Court, she won a $5-million settlement for the Cherokee Indians, and she introduced the first Southern black to practice before the Court.

Victoria Woodhull, the radical feminist who ran for the Presidency in 1872, feared that she would die if she went to bed in her old age. She spent the last four years of her life sitting in a chair. (She died at the age of eighty-nine in 1927.)

Abigail Adams wrote her husband, John, in 1776: "If

particular care and attention is not paid to the ladies, we are determined to foment a rebellion, and will not hold ourselves bound by any laws in which we have no voice or representation.'

During the American Revolution, many brides did not wear white wedding gowns, instead, they wore red as a symbol of rebellion.

Two female pirates, the English Mary Read and the Irish Anne Bonny, joined forces in 1719 when they found themselves quite by chance disguised as men on the same sloop (Each had been notorious before their encounter.) Together with a privateer, a Captain Rackham, they took command of the ship. When their vessel was captured, after many acts of piracy, the two women were among the only three pirates who fought it out on deck rather than surrender. When Rackham was hanged, Anne told him, 'If you had fought like a man, you need not have been hanged like a dog.' The women were committed to prison after pleading pregnancy. Mary Read died there of a fever, she would have been hanged after giving birth. Anne Bonny's fate is not certain.

As early as the thirteenth century in Lubeck, the free Hansa city in Germany, women were given the same legal status in business as men. They were also allowed to belong to workers' guilds.

There are fifteen nations that had given women the right to vote before the U.S. did in 1920. The earliest were New Zealand, in 1893, Australia, in 1902, and Finland, in 1906.

China was at times, relatively progressive in its attitude toward the education of women. They were allowed to study at medical schools during the reign of the Yuan emperors, which was from 1260 to 1368. Harvard Medical School did not enroll women until 1945.

Jeanette Rankin of Montana was elected in 1916 as the first woman member of the U.S. House of Representatives. She was elected again in 1940. During each of her two separate terms, Congress declared war in 1917 and 1941, and she was the only Representative to vote against both declarations.

Margaret Higgins Sanger, the birth-control pioneer, was one of eleven children.

A woman collected a federal pension for a war disability incurred in 1776, and is the only Revolutionary War veteran to be buried at the U.S. Military Academy, West Point. Margaret Corbin followed her husband to war and served in the field. He was killed, and she was crippled for life during action at Fort Washington, New York.

The generally accepted start-up date for the Industrial Revolution is roughly 1750, but it took a century for development of the first product that specifically lightened women's household tasks. It was Elias Howe's sewing machine.

The first female telephone operator was Emma M. Nutt, who started working for Telephone Dispatch Company in Boston, on September 1, 1878. Prior to that, all operators were men.

The women's suffrage amendment to the U S Constitution reached ratification by exactly one vote in the state of Tennessee, which became the th rty-sixth state to ratify it and therefore meet the Constitutional requirement that three-fourths of the states had to ratify it before it would become law. Harry Burn, a twenty-four-year-old Tennessee representative, cast the decisive 'yes' vote after receiving an exhorting note from his mother On August 26, 1920, the Nineteenth Amendment became effective

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She was eighty-seven years old when she became the first woman U S Senator, and she served for only a day. November 21, 1922 Rebecca Latimer Felton, a Democrat and the widow of a Georgia representative who had opposed reactionary machine politics, had long worked for women's suffrage, which became national law in 1920 She was appointed for a day to the Senate in a token gesture by the governor of Georgia, who had opposed the suffrage movement. 'The word "sex" has been obliterated from the Constitution,' Mrs Felton said on accepting her appointment 'There are now no limitations upon the ambitions of women.'

WORDS

Writing under the pseudonym Lewis Carroll English mathematician Charles L. Dodgson coined dozen of new nonsensical words in *Alice in Wonderland*, *Through the Looking Glass*, and his nonsense poem. Many of them are now part of the English language, like 'chortle' and 'galumph.' He called them portmanteau words forming most of them by telescoping two others and suggesting something from each. In *The Hunting of the Snark*, for example, the snark was reminiscent of both a snake and a shark. Wordmongers today have borrowed Carroll's technique and come up with portmanteau words like 'brunch,' smog, and 'guesstimation.'

Literacy in Iceland is 100 percent. Every Icelander must graduate from school in order to get a job, and he has to be able to speak three languages. The native language, namely Icelandic, which is the ancient language of the sagas, is spoken in no other country.

The man who devised an alphabet of raised letters for use by the blind was himself blind from the age of three. Louis Braille (ca. 1809-52). The Braille system, which evolved from Charles Barbier's method of writing with points, has sixty-three combinations of six raised points.

One of the greatest orators of all time, Demosthenes (384?-322 B.C.) was once a stutterer who stubbornly trained himself out of it, reportedly by putting pebbles in his mouth and practicing speaking aloud.

The Polish actress Helena Modjeska (1844-1909) was popular with audiences for her realistic and emotional style of acting. She once gave a dramatic reading in her native tongue at a dinner party of people who didn't know Polish, and her listeners were in tears when she finished. It turned out she had merely recited the Polish alphabet.

Various ancient peoples speaking a group of related languages were described in the Bible as having descended from Shem, one of the sons of Noah. The German historian August Ludwig von Schlozer suggested in 1781 that these languages be called 'Semitic.'

The literal meaning of 'lady' – in its Old English form 'hlaefdige' through the Middle English 'ladi, ladi') – is 'loaf-kneader.'

Hardly anybody speaks Russian in the province of Georgia, where Joseph Stalin was born. Russians from elsewhere find they have to learn Georgian, the official language, which is known as Gruz, in order to communicate there. When the Moscow government tried to make Russian mandatory, in 1977, there were riots – and the Soviets backed down.

The word 'million' didn't come into being until around 1300. Until then, the largest number word was 'myriad,' which was Greek for 10,000. Archimedes, in calculating the number of poppy seeds in the entire universe as he knew it, used expressions meaning 'myriads of myriads of myriads.'

Spartan youngsters were taught to be terse in speech. They were supposed to act rather than to talk; if they really had to talk, the less said, the better. The district surrounding the city of Sparta (and the first area Sparta came to dominate) was

named Laconia. To be terse in speech, therefore, is to be laconic.

The French philosopher René Descartes (1596–1650) speculated that monkeys and apes have the ability to speak but maintain their peace to avoid being put to work.

Winston Churchill's prodigious memory made it possible for him to repeat verbatim a lecture or a whole Shakespearean play.

The inhabitants of a slum called Trastevere, near Rome, speak a dialect all their own. They claim to have more than two thousand vulgar words to describe the human genitalia.

In eighteenth-century London, architecture went through a phase of being imitation Greek. The increasingly prosperous middle classes built town houses with Greek-temple touches.

Attic, or Athenian, architecture. Peaked roofs were placed over the main structures, as in Greek temples, and they were supported with pillars in front. That was the particularly Attic part of the house, and, in consequence, a room immediately under a peaked room became an 'attic.'

Throughout the ancient civilised world, men and women alike wore flowing clothing. When this drapery got in the way of work, it could be raised and bound in a belt or sash, hence the biblical phrase 'to gird one's loins,' meaning to get ready for work.

During Chinese Deputy Prime Minister Teng Hsiao-ping's meetings with President Jimmy Carter in Washington in early 1979, the U.S. did not have anyone fully qualified to provide a simultaneous interpretation from English to

Chinese. Mr Teng's interpreter, Chi Chaochu, could do it, however, and thus served both parties. Mr Chi is an official of the Chinese Foreign Ministry, and a Harvard graduate. President Richard Nixon, during his visits to China, also did not have the services of an American interpreter, and had to rely on his hosts for interpretation.

The much-quoted exhortation 'The only thing we have to fear is fear itself' was not original with the just-inaugurated Franklin Roosevelt in 1933. It originated with Francis Bacon three centuries earlier, and was echoed by Montaigne and Thoreau.

The phrase 'What a guy!' is a cry of derision in Great Britain and a cry of admiration in the U.S.

All the world's main alphabets have developed from an alphabet invented 3,600 years ago in the Middle East and known as the North Semitic Alphabet.

In a twelve-year effort – in a singular feat of original scholarship – the Cherokee silversmith Sequoyah (ca. 1770-1843) created an 'alphabet' (a syllabary of eighty-six characters) for the Cherokee language. His nation adopted it, and in just seven years was transformed into a literate society with a weekly newspaper. The sequoia tree is his living memorial.

A London teacher made the proposal that English, in addition to Latin, be taught in the classrooms of Renaissance England. No one paid much attention. The feeling was that English was just a patois that everyone knew and wasn't used for scholarly books.

There are over 170 different nationalities and more than 200 languages and dialects spoken in the Soviet Union

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The practice of linking characters of the alphabet to produce the small letters used today in writing originated in the monasteries of the Middle Ages. Scribes found it easier to write whole words without lifting their pens from the paper. They connected the individual characters instead of writing a character, lifting their pen, and writing another character, and on and on.

Amesian could be said to be the fourth most widely used 'language' in the United States. Amesian is an acronym for the *American sign language* used by the deaf. The first three most widely used languages in the U.S. are English, Spanish, and Italian.

Although the official language of India is Hindi, there are fourteen regional languages that are officially recognized for conducting national affairs. In addition, there are approximately 170 other languages and over 500 dialects. Of the Indian population of over 548 million, only about 134 million understand Hindi.

Most of the Carib Indians who once inhabited the lesser Antilles, West Indies, had three different languages. One language was used by the men, but women could use it when speaking to a man. The second language was that of women, men would only use it when mocking the women or quoting them. The third language, never learned by women, was used by men in councils of war.

A greater variety of languages existed in North America at the time of the Spanish invasion than in all the countries of the Old World put together. There was an even greater

variety in South America than in North America. The most conservative guesses put the number of mutually unintelligible languages in North America at from 500 to 1,000, and in South America at at least twice that.

Just because a word is in common use today doesn't mean it has been around for a long time. There was no word 'scientist' until it was coined by the English scholar William Whewell, in 1840. Sometimes it is the meaning that is new. The word 'energy,' for example, has been around for a long time, but it was not applied in the modern sense - as a term in physics - until 1807

'Philologically, the word "Kodak" is as meaningless as a child's first "goo". Terse, abrupt to the point of rudeness, literally bitten off by firm and unyielding consonants at both ends, it snaps like a camera shutter in your face What more would one ask?' - Inventor George Eastman, discussing the origin of the name of his camera, Kodak.

In the fourteenth and fifteenth centuries in England, the costliness and scarcity of plain pins caused Parliament to limit their sale to the first two days of January Women saved money throughout the year for this purpose - hence **the term 'pin money.'**

The inhabitants of the city of Soloi in ancient Cilicia (now Turkey) became so famous for their peculiarities in speaking the language of the conquering Greeks that a piece of bad grammar is today called a 'solecism.'

The word 'hussy' in the sixteenth century was perfectly respectable; it meant simply a housewife, derived from the short form of the Old English *husewif* Only one century

later, the word had come to mean a bold and shameless woman

Georges Schmidt, of the translation service of the United Nations, can translate sixty-six languages and speaks thirty fluently.

The average daily issue of the *Congressional Record* carries more than 4 million words – the approximate equivalent of twenty long novels. It is printed and published overnight

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In the original *Oxford English Dictionary* there is a twenty-three page essay on one word – 'set' – written by Henry Bradley.

Today, hospitals are thought of as places involved with medical and surgical care and cure. In the Middle Ages, 'hospital' meant a place of shelter and rest for travelers, and, later, a charitable institution providing for orphans, the aged, and the infirm – a 'hospitable' place. This early meaning survives in our words 'hostel' and 'hotel.'

Edward Everett, the ardent Unionist, a former American minister to the Court of St James's and a former president of Harvard College, was well known for his oratorical skills. On November 19, 1863, he delivered his best-known wartime oration. The occasion was the dedication of the national cemetery at Gettysburg. After Everett had spoken for two hours, President Lincoln got up and spoke for two minutes, delivering the famous Gettysburg Address.

Among the thousands of languages spoken around the world, about 175 languages are spoken natively by at least a million people. The ten largest languages each have over 100

million native speakers. They are, in descending order, Chinese, English, Russian, Spanish, Hindi, Bengali, Arabic, Portuguese, German, and Japanese

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The word 'noon' comes from the Latin *nonus*, which means 'nine.' Originally, it referred to the ninth hour of the day counting from sunrise, which, on the year-average, is at 6.00 A.M. This put *nonus* at 3.00 P.M., or halfway between midday and sunset. What was originally the middle of the afternoon has come to mean the middle of the day itself.

It took twenty years for the Accademia della Crusca to put together the first dictionary of the Italian language, which was published in 1612. The French Academy spent four years simply deliberating how to proceed with a dictionary of the French language, most of the forty members of the Academy then spent more than half a century – fifty-five years, to be precise – writing it, publication was in 1694. Samuel Johnson wrote his *Dictionary of the English Language* mainly by himself, in a few years – one of the monuments of English scholarship. He wrote the definition of more than 40,000 words and handled more than 200,000 illustrative quotations, of which 114,000 were included in the dictionary, published in 1755. The first edition of the *Oxford English Dictionary* took forty-eight years to compile, the editor, James A. H. Murray, had worked on the dictionary for thirty-five years by the time he died in 1915, not until 1928, almost seventy years from the time the Philological Society had resolved to prepare a new English dictionary, did the last part appear. Currently there are thirteen volumes, 15,487 pages, 414,825 defined words, and 1,827,306 illustrative quotations.

Winston Churchill's 'blood, sweat, and tears' of World War II had a long tradition. John Donne, in 1611, wrote, 'Mollify it with thy tears, or sweat, or blood.' Lord Byron,

in 1923 'Year after year they voted cent per cent. Blood, sweat, and tear wrung millions – why for rent' Lord Alfred Douglas in 1919 'If poetry is forged [illegible] and passions [illegible] ink with sweat and blood and tears' Churchill himself first used the phrase in 1939, writing about the armies of the east, before the Russian Revolution 'Their sweat, their tears, their blood hedewed **the endless plain.'**

'Journal' does not contain a single letter of the Latin word from which it is derived [illegible] day. Among the intermediate steps in its development were the Latin *diarnus*, the Italian *giornata*, and the French *[illegible]*

Language reflects the things that occupy us most. In the Solomon Islands, in the Pacific Ocean, there are nine different words for the various stages of the maturation of a coconut, but there is no one word that corresponds to our 'coconut'. In contrast, one word is applied there to the four **meals of the day.**

In the first half of the seventeenth century there was a small but busy fur trading district on Manhattan Island that was visited by many different people. By 1644, eighteen different languages were spoken at the bustling **lower tip of Manhattan.**

A major contributor to the first *Oxford English Dictionary* was a longtime inmate of Broadmoor Criminal Lunatic Asylum. Dr W. C. Minor, incarcerated for a street murder brought on by a persecution mania, submitted 12,000 sources in one year alone. He had been a surgeon-captain in the Army of the North in the U.S. Civil War and suffered his first mental breakdown when ordered to brand a soldier who had deserted.

In New Guinea, home of the last direct survivors of the Stone Age, there are 700 cultures, and 700 languages and dialects are spoken. Villages within five miles of each other speak different tongues. A day's canoe trip of fifty miles could expose the traveler to ten or more languages.

Some odd words enter into the scientific vocabulary. When the rotation period of a neutron star changes suddenly, it is called a 'glitch.' Why? A Jewish astronomical observer noticed a change in the regularity of the pulse of a star, as though there had been a sudden slip. In referring to this colloquially he used the Yiddish word for 'slip,' which is *glitch*, and the designation stuck.

To the early Greeks, foreign languages seemed to be a meaningless succession of syllables, like 'bar-bar bar.' They called all foreigners *barbaroi* 'stammerers', and in English this became 'barbarians.' At first, there was no particularly derogatory meaning to the word. It simply stood for 'foreigner.' After all, the Greeks were encountering foreigners like the Syrians, Egyptians, and Babylonians, all highly cultured people.

A forty-five letter word connoting a lung disease, pneumonoultramicroscopicsilicovolcanoconiosis, is the longest word in *Webster's Third New International Dictionary*. The longest word in the *Oxford English Dictionary* means the act of estimating as worthless: floccipaucinihilipilification, which has twenty-nine letters.

The Scottish writer Robert Bontine Cunninghame Graham, who had won a seat as a Liberal member of Parliament in 1886, was suspended from the House of Commons for having had the audacity to use the word 'damn' in a public speech.

Thales the Greek philosopher, noticed that amber decorations on spinning wheels attracted threads, feathers, and light objects through what is known to be static electricity. The Greek word for amber is *elektron*, from which William Gilbert, physician to Queen Elizabeth I, coined the word 'electricity.'

The fame of the Czech physiologist Jan Evangelista Purkinje rests not on his work in medicine or in microscopy but on a single word 'protoplasm.' He coined the word partly because of his theological training. It means 'first formed,' which is how Adam is described in the Bible. In 1839, Purkinje referred to the granulous embryonic material in the egg as the protoplasm, which has come to mean quite generally the living material within the cell, that is, the first-formed material.

'Crystal' is from a Greek word meaning 'ice.' When the first quartz crystals were found, so amazing was their quality of transparence that they were assumed to be ice that for some reason could not melt. The word 'crystal' was used to mean 'transparency' rather than a natural geometric solid. That is why we speak of a fortune-teller's crystal, though it is just a sphere of glass that has no crystalline shape at all. However, all quartz is not transparent. It may be translucent or opaque, it may be colored or colorless.

A germ is not necessarily a bacterium, it is any small scrap of life. That's why egg cells and sperm cells are called 'germ cells.' And why the little bit of living protoplasm in the wheat kernel is called 'wheat germ.'

The word 'curfew' is derived from an old French word that

means 'cover fire.' In Europe during the Middle Ages, a curfew was a metal cone or shield that was used to put out the hearth fire in the evening. The word 'curfew' came to mean the end of the day's activities.

Oliver Wendell Holmes (1809-94), American poet, philosopher, and physician, invented the word 'anesthesia' for the process by which ether and other substances were found to remove sensations of pain.

At least fifty years before the beef-cattle industry boomed in Texas, vaqueros whose range was Spanish California set the style, evolved the equipment and techniques, and developed much of the vocabulary that later was used by the American cowboy.

The word 'ozone' got its name from the Greek *ozo*, which means 'I smell.' (Ozone is the most reactive form of oxygen. It is an unstable, pale bluish gas with a penetrating odor.) Christian Friedrich Schonbein, a German chemist, thought the smell of electricity, produced in the laboratory by passing dry air between two plate electrodes connected to an alternating current of several thousand volts, was somewhat like chlorine. Thinking he had a chlorine-like substance, perhaps even chlorine in combination with other elements, Schonbein coined the word ozone, in 1840.

It would be improper for a scientist to name a discovery after himself. Thus, when the French chemist Paul Émile Lecoq de Boisbaudran discovered a new element in 1874, he named it 'gallium' after Gallia, the Latin name for what is now France. However, *le coq* is 'the rooster' in French, and *gallus* is 'rooster' in Latin. There is at least a suspicion

that Lecoq de Boisbaudran was doing a little crowing on his own

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Though it is believed that Columbus was from Genoa he never wrote in any form of Italian, not even to Genoese. He **wrote only in Spanish.**

The bloody battle of Magenta in northern Italy between a combined Franco-Sardinian army and an Austrian army in 1859 gave its name to the beautiful red-purple dye and color synthesized by French chemists shortly after the battle - magenta, the color of blood.

German was the official language of Prague until 1860. The city had been settled by Germans in the thirteenth century. When the newly created Czechoslovakia became a republic in 1918, Prague became its capital.

At a gathering of Russian Communist leaders in Brussels in August 1903, Lenin managed through his eloquence to get a majority to vote on his side. With a sure propaganda touch, he immediately labeled his group the Bolsheviks, 'the majority.' Subsequently, the group won few votes, and was actually a minority, but the name 'bolsheviks' stuck, adding to the prestige of Lenin's followers.

Mudslinging dates back to the time of the Romans. White togas were worn by all candidates for office in the Roman senate. Citizens threw mud at an unpopular candidate until his toga became *toga maculosa*, a toga dotted with mud. Cicero referred to the victims as 'polluted senators.' They were no longer to be 'candidates' - which means, literally, 'white ones.'

One legal term for having sexual intercourse with someone else's spouse – i.e., adultery – is 'criminal conversation'

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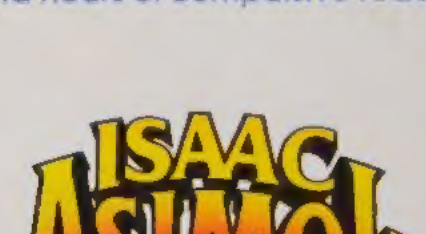

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